

Optimizing Thyroid Medications

Best Practices from your
Thyroid Pharmacist



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About The Author



Dr. Izabella Wentz, PharmD, FASCP is a pharmacist who has dedicated herself to addressing the root causes of autoimmune thyroid disease after being diagnosed with Hashimoto's Thyroiditis in 2009. Dr. Wentz received the Doctor of Pharmacy Degree in 2006, and is a Fellow of the American Society of Consultant Pharmacists.

She holds certifications in Medication Therapy Management, Advanced Diabetes Care and is a 2013 recipient of the Excellence in Innovation Award from the Illinois Pharmacists Association.

She is the author of the New York Times best-selling patient guide "[Hashimoto's Thyroiditis: Lifestyle Interventions for Finding and Treating the Root Cause](#)" and a co-founder of the Hashimoto's Institute.

Dr. Wentz is dedicated to educating the public and healthcare professionals about the impact of appropriate diagnosis, proper medication management, lifestyle interventions and functional medicine methods on the treatment of thyroid and autoimmune conditions.

www.thyroidpharmacist.com

My Personal Thyroid Journey

“Chernobyl Child”

The more I learn about the many triggers of Hashimoto’s and look back on my personal health history, the more I’ve come to realize that my condition likely started developing decades before I was officially diagnosed, and perhaps 15 years before my initial symptoms began.

I grew up in Hostynne, Poland, a small farming village on the southeast side of Poland. I was exposed to Chernobyl at age 4. My mom recalls that I was a child prone to anxiety, and I can’t think of a time when I didn’t have cold hands and cold feet!

I recently read a startling statistic – as many as 81% of children exposed to Chernobyl had thyroid antibodies!

Once thyroid antibodies are present, a person will have a fluctuation of thyroid hormone levels that lasts for decades before hypothyroidism develops. This fluctuation can cause many confusing symptoms, often of both hypothyroidism and hyperthyroidism. This was the case for me, and likely the root cause of my bouts of anxiety, depression, cold hands and poor growth during childhood and young adulthood.

Around the time I was going through puberty (often a peak time for a thyroid condition to manifest), my mom noticed that I developed a slight goiter. She took me to get evaluated by an endocrinologist, who reported that my thyroid gland was normal.

I went on to struggle with depression, but this subsided after puberty.

I didn’t start to have symptoms again until my freshman year of undergraduate school, after a bout of mono (an illness caused by the virus Epstein-Barr which is often implicated in triggering and exacerbating thyroid conditions).

I never fully recovered from that infection, and began to battle with fatigue, sleeping for 12-14 hours each night to feel rested. As years went on, my health began to decline. I went on to develop irritable bowel syndrome, carpal tunnel in both arms, acid reflux, brain fog, allergies, anxiety, weight gain and hair loss. I sought the advice of many doctors for my symptoms, who suggested that I was either a) depressed b) stressed due to my studies or c) getting older (I was 25!).

It wasn't until I finished my studies as a pharmacist and began to work with clients with complicated health conditions and began to take advanced medical training that I realized that something was really off about my health.

I found doctors that were willing to do more comprehensive testing and learned that I had Hashimoto's and subclinical hypothyroidism.

This was in 2009, and over the course of the last 6 years, I've dedicated my career to researching optimal treatments for the condition, as well as innovative ways that can help people feel better and get Hashimoto's into remission.

Today I feel better than I have in years. I no longer need to sleep half of my life away! My hair has grown back and I no longer struggle with pain or stomach issues. My memory is sharp and have no traces on anxiety, unless I overdo it on caffeine (I'm still human)!

My weight has been stable for the last four years and I've been able to reduce my thyroid antibodies to the range of a healthy person without thyroid disease! Helping others do the same has become my passion and my life's work!!

A picture is worth a thousand words...



Before: 2009 - Tired, anxious, cold, losing hair, in pain, sluggish and bloated



After: 2014 - Today: feeling alive, balanced and happy!

The Role of Thyroid Hormones

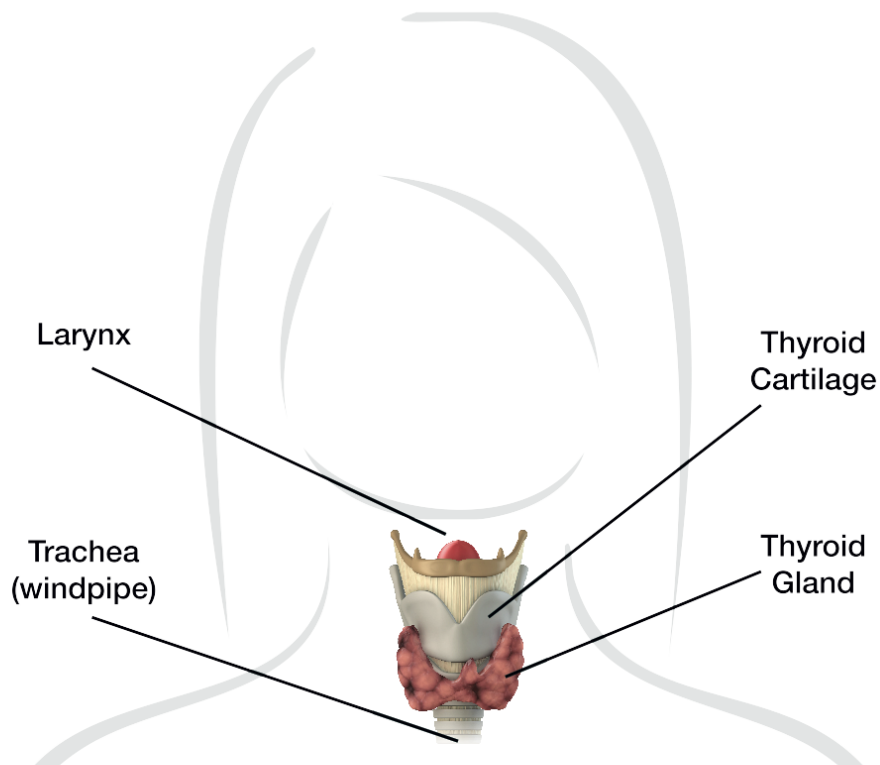
Thyroid hormone receptors are present in just about every cell in the body and have the important role of controlling our metabolism.

Getting the right person on the right kind of thyroid medication, given at the right dose, at the right time and in the right way can make a tremendous difference to their symptoms, especially in energy, weight and hair appearance.

Before we dive deeper into optimizing thyroid medications, let's get familiar with the role of the thyroid gland, the primary cause of hypothyroidism, thyroid symptoms and some of the terminology used in thyroid testing.

So What the Heck Is a Thyroid?

The thyroid gland is a butterfly-shaped organ located in the neck below the Adam's apple. It produces thyroid hormones, which affect the function of just about every organ system in the human body.



Thyroid hormones are responsible for the crucial tasks of stimulating metabolism of the foods we eat, extracting vitamins, and producing energy from food. They are also vital to the production of other hormones as well as to the growth and development of our nervous system.

The thyroid has been called the “thermostat” of the body, as it maintains our temperature. Indirectly, thyroid function affects every reaction in the human body since the temperature has to be just right for these reactions to take place properly.

Thyroid Hormone Production

The thyroid gland is responsible for the production of thyroid hormones from the amino acid tyrosine and the nutrient iodine.

Iodide, absorbed from food, circulates in our blood and is absorbed into the thyroid gland, where it must be converted into a form usable by the body through an oxidation process.

The enzyme thyroid peroxidase (TPO) converts **iodide** to the active **iodine**, making hydrogen peroxide as a byproduct. Selenium is needed to “tame” the hydrogen peroxide, which can damage the thyroid gland when it’s produced in excess.

This active **iodine** molecule attaches to the amino acid tyrosine through a process known as “iodination.”

During iodination, each molecule of tyrosine combines with one or two iodine molecules, resulting in either moniodotyrosine (T1) or diiodotyrosine (T2).

The molecules then bond together to form either triiodothyronine (T3, containing three iodine molecules) or thyroxine (T4, containing four iodine molecules).

$T1 + T2 = T3$

$T2 + T2 = T4$

Of the four molecules, only T3 and T4 are biologically active in the body.

Thyroxine (T4) is known as a “pro-hormone” and is 300 percent less biologically active than T3. Triiodothyronine (T3) is the main biologically active thyroid hormone.

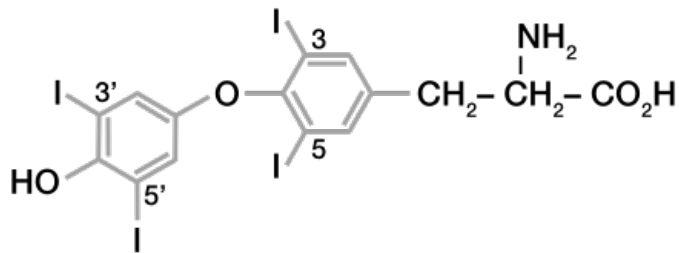
Twenty percent of the T3 hormone comes from thyroid secretion, while the remaining 80 percent comes from T4 when T4 is converted to T3 through the deiodination process in the

body, where one iodine molecule is removed from the T4 molecule to form T3 in organs like the liver and kidney. Adequate amounts of zinc, as well as numerous other minerals are required to convert T4 to T3.

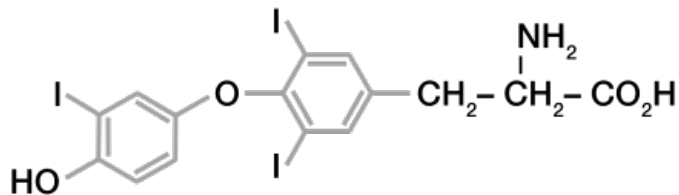
Low levels of T3 and T4 signal the release of TSH (thyroid stimulating hormone), while high levels of circulating T3 and T4 stop the release of TSH. In people with normal thyroid function, TSH levels may fluctuate in times when more thyroid hormone is consumed, such as in stress, illness, lack of sleep, pregnancy, or low temperatures.¹⁵

The T3 and T4 Molecules

L-Thyroxine (T4)



3, 5, 3'-Triiodo-L-Thyronine (T3)



Thyroid Hormone Disorders

Thyroid hormone disorders can be classified as those resulting in inadequate thyroid hormone production (hypothyroidism) and those causing an overabundance of thyroid hormone production (hyperthyroidism). This book will focus on the treatment of **HYPO**thyroidism.

Hypothyroidism

Common symptoms of hypothyroidism, or thyroid hormone deficiency, include a slowed metabolism, weight gain, forgetfulness, feeling cold or cold intolerance, depression, fatigue, dry skin, constipation, loss of drive, hair loss, muscle cramps, stiffness, joint pain, a loss of the outer third eyebrow, menstrual irregularities, infertility, and weakness.

Iodine Deficiency Versus Hashimoto's

When there is a deficiency in the building blocks required to make thyroid hormone (iodide, selenium, zinc, and tyrosine), TSH is triggered to signal additional production of TPO to start converting the stored iodide to a usable form (this also results in hydrogen peroxide production). If no iodide is available, the body will attempt to increase thyroid hormone production by making bigger thyroid cells, thus resulting in an enlarged thyroid gland known as a goiter.

Iodine deficiency is the leading cause of hypothyroidism in many underdeveloped countries, and can cause both hypothyroidism and goiters.

In the United States and many European countries however - where iodine is added to salt or other foods - **Hashimoto's** is the leading cause of hypothyroidism, **not** iodine deficiency.

Hashimoto's is responsible for 90 percent of hypothyroidism cases in the U.S.

Additional causes of hypothyroidism include silent (or painless) thyroiditis and postpartum thyroiditis, both of which are associated with antibody production but resolve on their own with a normalization of thyroid antibodies and return to optimal thyroid function. In many cases, however, these conditions may be followed years later by Hashimoto's. Silent thyroiditis has been associated with seasonal allergies, viral infections, and vigorous neck massage. The trigger for postpartum thyroiditis is pregnancy. Perhaps these two

conditions are examples of the beginning of an autoimmune response that becomes extinguished once the triggers are removed.

So What is the Difference Between Hypothyroidism and Hashimoto's?

Hypothyroidism, by definition, is a clinical state. It is a state of low levels of thyroid hormone in the body.

The low levels of thyroid hormone can occur as a result of a variety of different reasons, such as iodine deficiency, surgical removal of the thyroid, excess use of thyroid suppressing medications, pituitary suppression or damage to the thyroid (physical or disease induced).

Unfortunately many people think that if they had Hashimoto's, their doctors would have certainly told them.

But that's not usually the case.

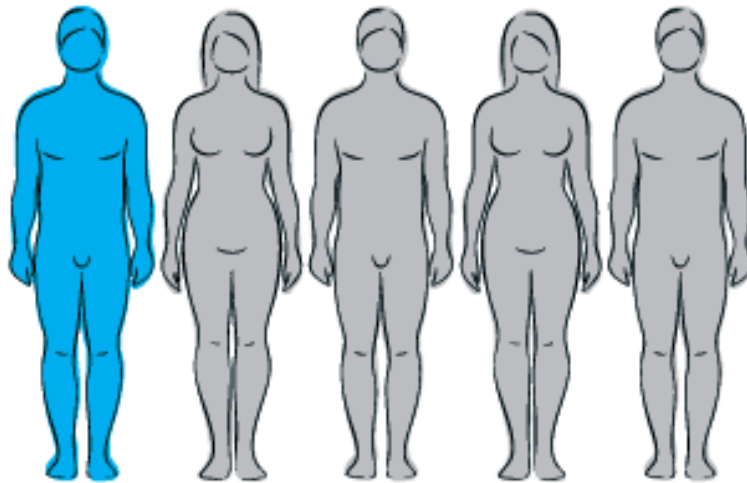
Many doctors simply don't test their patients for Hashimoto's. That's because the conventional medical model treats autoimmune thyroid disorders in the same way as they would treat someone with a nutrient deficiency induced thyroid disorder, a congenital defect of the thyroid gland, someone who was born without a thyroid or someone who had their thyroid removed or treated with radioactive iodine... with synthetic thyroid hormones.

Hashimoto's causes the immune system to form antibodies against the thyroid gland, resulting in our own immune system attacking our thyroid gland as though it were a foreign invader, like a bacteria or virus. This autoimmune attack eventually leads to hypothyroidism, and is the cause of 90-97% of cases of hypothyroidism in the United States.

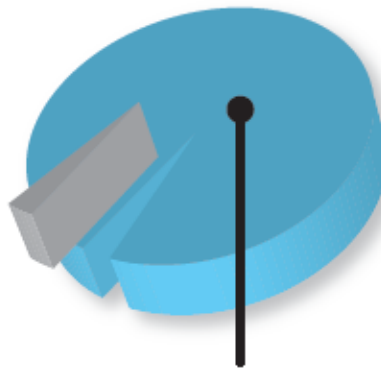
The Autoimmune Thyroid Connection

Most cases of hypothyroidism in the United States, Canada, Europe and countries that add iodine to their salt supply are caused by Hashimoto's, an autoimmune condition. Depending on the source, estimates are that between 90-97% of those with hypothyroidism in the United States actually have Hashimoto's.

HYPOTHYROIDISM IN THE U.S.



1 in 5 Americans have Hypothyroidism. Only half of them know it.

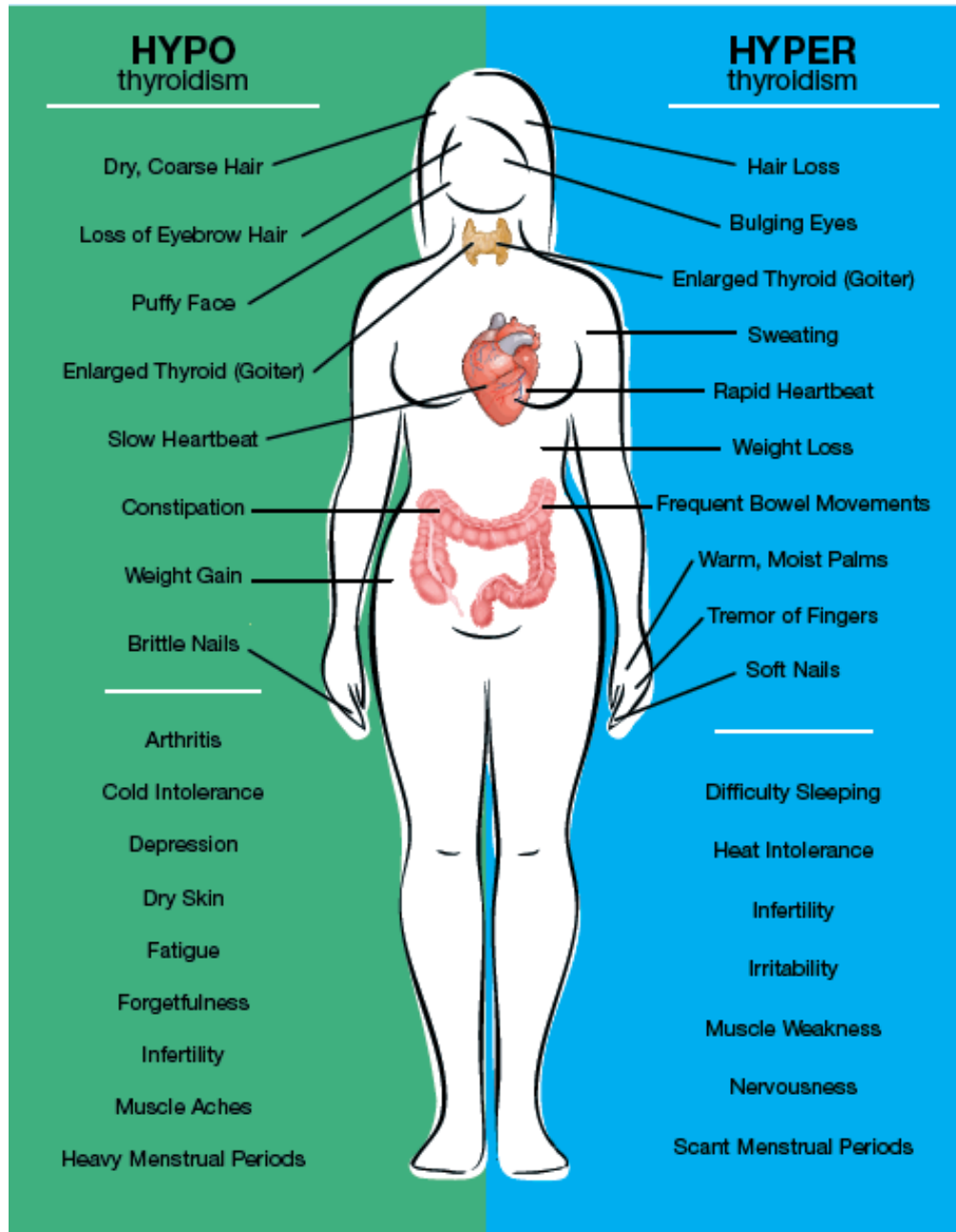


97% of Hypothyroidism cases are Hashimoto's Thyroiditis!

Common Thyroid Symptoms

Some of the more common symptoms of **hypothyroidism**, or deficiency of thyroid hormone, include:

Hyperthyroidism, or an overabundance of thyroid hormone has a stimulatory effect. Classic symptoms include:



Additional Hashimoto's Symptoms

People who are newly diagnosed with Hashimoto's are often confused about the symptoms they are experiencing.

I know I was shocked to have been diagnosed with hypothyroidism and not hyperthyroidism. I was thin, anxious, irritable and had heart palpitations, in addition to feeling cold, forgetful and tired.

What I didn't know at the time, is that 90-95% of cases of hypothyroidism are caused by Hashimoto's, an autoimmune attack on the thyroid, and Hashimoto's has a unique set of symptoms compared to non-autoimmune hypothyroidism.

People with Hashimoto's may experience BOTH hypothyroid and hyperthyroid symptoms because as the thyroid cells are destroyed, stored hormones are released into the circulation causing a toxic level of thyroid hormone in the body, also known as thyrotoxicosis or Hashitoxicosis.

Eventually, the stored thyroid may become depleted and due to thyroid cell damage, the person is no longer able to produce enough hormones. At this time, hypothyroidism develops.

In addition to experiencing symptoms of hypo- and hyperthyroidism, most people with Hashimoto's also experience a variety of other symptoms, especially gastrointestinal distress, such as Irritable Bowel Syndrome (IBS), Acid Reflux (GERD), diarrhea, constipation, bloating etc.

These symptoms were my first clue at making a connection between my autoimmune condition and the status of my intestinal health. I soon came to learn that the intestines control the immune system!

Therefore, one key to restoring thyroid health lies in restoring the health of your intestines.

Could You Have a Thyroid Problem?

Many cases of thyroid problems are missed because most doctors don't perform a comprehensive test panel. I spent almost a decade suffering from debilitating fatigue because I only had my TSH tested. If you suspect that you may have a thyroid disease, here's a list of tests to take to your doctor.

Top 6 Thyroid Tests

Here is a list of the Top 6 thyroid tests to take to your doctor and ask for tests for Hashimoto's and hypothyroidism.

- TSH (Thyroid Stimulating Hormone)
- Thyroid peroxidase antibodies (TPO Antibodies)
- Thyroglobulin Antibodies (TG Antibodies)
- Thyroid Ultrasound
- Free T3
- Free T4

Ordering Tests

If your doctor will not order these tests for you, you can pay out of pocket and order them yourself through a company like [Direct Labs](#). To view a list of recommended labs, click [here](#).



Understanding Thyroid Tests

Here is a comprehensive list of the top thyroid tests to talk to your doctor about. Be sure to request a copy of your thyroid labs, so that you can see them yourself and ensure that they are interpreted correctly.

Thyroid Stimulating Hormone (TSH) - This is a pituitary hormone that responds to low/high amounts of circulating thyroid hormone. In advanced cases of Hashimoto's and primary hypothyroidism, this lab test will be elevated. In the case of Graves' disease the TSH will be low. People with Hashimoto's and central hypothyroidism may have a normal reading on this test.

Thyroid peroxidase Antibodies (TPO Antibodies) and Thyroglobulin Antibodies (TG Antibodies) - Most people with Hashimoto's will have an elevation of one or both of these antibodies. These antibodies are often elevated for decades before a change in TSH is seen. People with Graves' disease and thyroid cancer may also have an elevation in thyroid antibodies including TPO & TG, as well as TSH receptor antibodies.

Thyroid Ultrasound - A small percentage of people may have Hashimoto's, but may not have thyroid antibodies detectible in the blood. Doing a thyroid ultrasound will help your physician determine a diagnosis.

Free T3 & Free T4 - These tests measure the levels of active thyroid hormone circulating in the body. When these levels are low, but your TSH tests in the normal range, this may lead your physician to suspect a rare type of hypothyroidism, known as central hypothyroidism.

Reverse T3 - Reverse T3 is a test that may sometimes be used to determine if a person is having increased rates of this thyroid receptor blocker.

LIMITATIONS OF THE TSH TEST

Most conventional physicians use the TSH test to determine if one has a thyroid disorder and as a measure by which to dose thyroid medications.

However, this test can oftentimes be misleading, as levels of circulating hormones may fluctuate at different times, such as, in Hashimoto's the person affected may fluctuate between highs and lows.

Additionally, when scientists first set the “normal” ranges of TSH for healthy individuals, they inadvertently included elderly patients and others with compromised thyroid function in the calculations leading to an overly lax reference range.

This resulted in people with low thyroid hormones being told that their thyroid tests were “normal,” based on this skewed reference range.

In recent years, The National Academy of Clinical Biochemists indicated that 95% of individuals without thyroid disease have TSH concentrations below 2.5 $\mu\text{IU/L}$, and a new normal reference range was defined by the American College of Clinical Endocrinologists to be between 0.3- 3.0 $\mu\text{IU/ml}$.

However, most labs have not adjusted that range in the reports they provide to physicians, and have kept ranges as lax as 0.2-8.0 $\mu\text{IU/ml}$. Most physicians only look for values outside of the “normal” reference range provided by the labs, and may not be familiar with the new guidelines. As a consequence, many physicians may miss the patients who are showing an elevated TSH. This is one reason why patients should always ask their physicians for a copy of any lab results.

Functional medicine practitioners have further defined normal reference ranges to be between 1 and 2 $\mu\text{IU/ml}$, for a healthy person not taking thyroid medications. Anecdotally, most patients feel best with a TSH between 0.5-2 $\mu\text{IU/ml}$.

It’s important to remember that reference ranges may not be applicable to everyone. What is normal for one person may be abnormal for the next. Reference ranges take into account the average values of 95% of the population. Therefore, not everyone falls within the “normal” reference range. If you are in the 5%, you may experience symptoms of hypothyroidism or hyperthyroidism with TSH values that are considered normal. All doctors are taught the old adage “treat the patient and not the lab tests,” but unfortunately not many conventional doctors seem to follow this advice.

Some thyroid advocates may dismiss the use of the TSH altogether, but I disagree. When considered in the right context and the right reference range, the TSH is one of the many tests that may be useful to optimize thyroid function. Other tests that I recommend include Free T3 and Free T4 levels. These reveal the amount of hormone available to the body.

Central hypothyroidism

Central hypothyroidism occurs when the TSH, a signaling hormone, is in the normal or low reference range, while the actual thyroid hormone levels are in the low range. Central

hypothyroidism demonstrates a miscommunication between the thyroid gland and the pituitary gland, which produces the TSH hormone.

While pituitary tumors and traumatic brain injury are very serious and important causes of central hypothyroidism, most cases of central hypothyroidism are due to the use of medications or supplements that interfere with the communication pathways.

Glucocorticoid medications like prednisone, especially when given in high doses and at bedtime, can suppress the TSH hormone, even when T3 and T4 levels are low, leading to central hypothyroidism. I've also seen this in people taking adrenal glandular, and adrenal hormones.

Dopamine mimicking medications, like bromocryptine, and theoretically some antidepressants that act on dopamine pathways, can also lower the TSH.

Other medications that can alter thyroid hormones include medications used for certain tumors, including somatostatin analogs and rexinoids. Antiepileptic medications including carbamazepine and valproic acid derivatives, as well as metformin which is used for diabetes, may also alter TSH, however this has not been verified by multiple studies at present time.

Take Charge of Your Own Health!

Personally, I still have a copy of a TSH test that showed a value of 4.5 μ IU/ml with a note from the physician that said "Your thyroid function is normal. No need to do anything". Meanwhile, I was sleeping 12+ hours per night, under two blankets in Southern California and wearing sweaters in the middle of July! I made the mistake of trusting another human being with my health, and I lost a year of my life because of it. Instead of pursuing my passions, I came home from work each day and collapsed. I don't want you to make the same mistake I did.

Starting on thyroid medications made me less anxious and gave me more energy. I also was able to tolerate the Southern California winters without bundling up!

I encourage you to take charge of your own health. Learn as much as you can about your condition. Always request a copy of your labs. Don't be afraid to tell your doctor that you are not feeling well on current therapy and insist on getting better care. There are plenty of doctors out there that will provide the care you need, so don't be afraid to seek out a second opinion.

Deciphering Thyroid labs

I encourage every person to ask his/her physician for a copy of thyroid labs, so that he/she can be informed and understand what's happening in his/her own body. This table shows how your lab results can help you make sense of your symptoms.

TSH	Free T3	Free T4	TPO/TC Antibodies	Meaning
Normal	Normal	Normal	-	This is an indication that the person is euthyroid, with a low risk of Hashimoto's. Additional testing
Normal	Low	Low	+/-	Central hypothyroidism
Normal	Normal	Normal	+	Euthyroid Hashimoto's
Elevated	Normal	Normal	+/-	Subclinical hypothyroidism
Elevated	Low	Low	+/-	Hypothyroidism
Low	Normal	Normal	+/-	Subclinical hyperthyroidism
Low	High	High	+/-	Hyperthyroidism

Your personal best thyroid numbers

Your optimal thyroid numbers are going to be different from your mother's optimal thyroid numbers, which are going to be different from your neighbor's optimal thyroid numbers, so it's important for you to track your thyroid symptoms while taking thyroid medications, to determine your "personal best".

Most of my readers and clients will reports that they feel best with a TSH between 0.5 and 2 µIU/ml and when their Free T3 and Free T4 are in the top half of the reference range.

Survey Says...

A survey of 2232 Root Cause readers found the following results regarding which medications and which TSH ranges made the participants feel better or worse.

Please use these results to guide your treatment plan, but also remember that you are a person and not a statistic. Just because most people felt better on a particular medication, doesn't mean that this will be your ideal medication!

TSH range	Felt Better	Felt Worse	Did not notice difference
Under 1 μ IU/ml	70%	12%	18%
Between 1 and 2 μ IU/ml	57%	20%	23%
Above 2 μ IU/ml	10%	67%	23%

The 5 R's of Optimal Thyroid Medications Use

1. Right Person

2. Right Drug

3. Right Dose

4. Right Time

5. Right Way

Side Effects And Precautions

Thyroid medications should not be used by people who have **hyper**thyroidism, or an overactive thyroid, or by those who are experiencing a heart attack.

A person who has adrenal insufficiency such as Addison's disease should not take thyroid hormones, until the adrenal insufficiency is corrected, as the thyroid hormones can increase the clearance of adrenal hormones, leading to an adrenal crisis which can be life-threatening.

WARNING:

Thyroid hormones, including SYNTHROID, either alone or with other therapeutic agents, should not be used for the treatment of obesity or for weight loss for people without thyroid disease. Larger doses may produce serious or even life threatening manifestations of toxicity, particularly when given in association with sympathomimetic amines such as those used for their anorectic effects.

Thyroid medication have a narrow therapeutic index, meaning that they are “goldilocks” hormones, and that careful dose titration is needed. Doses that are incorrect by just a tiny amount can result in symptoms resulting from over-treatment or under-treatment.

Unlike other types of medications which are lab-made chemicals that mimic or block the activity of normally occurring chemical messengers in our bodies, thyroid medications are identical in structure to our naturally occurring thyroid hormones.

Therefore, most side effects of thyroid medication result from improper medication selection and dosing.

Side effects related to under-dosing include: fatigue, joint pain, hair loss and depression.

Side effects related to over-dosing include: rapid or irregular heartbeat, chest pain, shortness of breath, leg cramps, headache, nervousness, irritability, sleeplessness, tremors, change in appetite, weight loss, vomiting, diarrhea, excessive sweating, heat intolerance, fever or changes in menstrual periods.

In some cases, individuals may be sensitive to the fillers used in thyroid medications. Rare instances of hypersensitivity to thyroid hormones have been reported.

Right Person

Are you a candidate for thyroid medications?

When used appropriately, medications are the quickest and most effective way to reduce thyroid symptoms. They can also reduce the autoimmune attack on the thyroid gland, reduce goiter size, reduce the likelihood of thyroid cancer, and can give you the energy and clarity of mind to keep working towards improving your health.

Giving thyroid hormones to a person who has Hashimoto's, without a person having overt hypothyroidism is still a controversial subject in conventional medicine.

Current medical guidelines regarding whether a person with Hashimoto's should start replacement thyroid hormone are primarily determined by lab tests and secondly, the patient's symptoms.

Traditionally, physicians did not prescribe thyroid hormones when someone was considered to have subclinical hypothyroidism (elevated TSH but normal to borderline low T4 levels), but more progressive endocrinologists and physicians now recognize the value of beginning thyroid hormone supplementation in subclinical hypothyroidism, especially in those experiencing symptoms of hypothyroidism.

New guidelines also recommend starting supplemental thyroid hormone earlier in the game—even if T4 levels are still normal to borderline low.

Conservative recommendations are to start supplemental hormones in subclinical hypothyroidism when the TSH is above 10 $\mu\text{IU/ml}$ (without symptoms) and when the TSH is between 3 and 10 $\mu\text{IU/ml}$ if symptoms are present.

Additionally, new studies have shown that taking thyroid medications can help to reduce the number of circulating thyroid antibodies, even in subclinical and euthyroid Hashimoto's!

However, a 2012 survey of 380 thyroidologists at the 14th International Thyroid Congress, found that most of them would not treat a woman with subclinical hypothyroidism, unless the woman was pregnant. Some doctors may not be willing to give their patients thyroid hormones even when the patients have clear hypothyroid symptoms like weight gain (just eat less - exercise more), depression (see a psychiatrist) or fatigue (we're all tired!).

In many cases, the empowered patient may need to seek the advice of more open-minded clinicians, such as a hormone specialist, an OB-GYN, or an integrative or functional medicine practitioner in order to get proper treatment.

A 2014 study found that people with subclinical hypothyroidism have improved outcomes when they are started on thyroid medications. Thyroid antibodies drop, people have fewer symptoms and the disease progression slows down.

Special Conditions

Certain conditions may impact the way we tolerate and clear thyroid medications. If you have any of these conditions, be sure to discuss the impact of thyroid medications on your condition.

Addison's Disease: Always be sure you are tested for Addison's disease before starting on thyroid hormones. Addison's disease is an autoimmune condition that affects the adrenal glands. Starting thyroid medications in someone who has untreated Addison's disease can cause an increased clearance of glucocorticoids, hormones which are usually deficient in Addison's, resulting in a life threatening reaction.

Pregnancy: Thyroid medications are Pregnancy Category A, which means that they are considered to be safe medications for using during pregnancy. Being on the correct dose of thyroid medication can actually help women conceive, as well as prevent miscarriage. If you get pregnant while taking thyroid hormones, be sure to see your doctor as soon as possible to test your levels. You will very likely need to increase your dose, as pregnancy increases the requirement of thyroid hormones.

Diabetes: symptoms of diabetes may be exaggerated or aggravated after starting thyroid medications

Cardiovascular disease: chronic hypothyroidism predisposes people to heart disease. Starting thyroid hormones may worsen cardiac symptoms, and a slower dose increase is recommended.

Right Drug: Types of Medications

There are three types of medications that can be used to treat an underactive thyroid:

1. Levothyroxine (T4) containing medications (including Synthroid, Levoxyl, Levothyroxine, Euthyrox, Levotheroid, Unithroid, Eltroxin and Tirosint)
2. Liothyronine (T3) containing medications (Cytomel, liothyronine and compounded T3)
3. Combination T4/T3 medications (Armour, Nature-Throid, WP Thyroid, Erfa Thyroid, and compounded T4/T3 medications).

Thyroid Medications

Brand Name (Generic Name)	Description
Armour® Thyroid Nature-Throid® WP Thyroid® NP Thyroid® (Thyroid USP)	Desiccated pork thyroid gland T4/T3 combination Mimics the biological ratio of 80% T4 to 20% of T3 with a T4:T3 ratio of 4:1 May also contain TPO and thyroglobulin, which can perpetuate the autoimmune attack in some
Proloid® (Thyroglobulin)	Partially purified pork thyroglobulin T4:T3 ratio of 2.5:1
Synthroid®, Levothyroid®, Levoxyl®, Thyro-Tabs®, Unithroid® (levothyroxine)	Synthetic T4 Variable absorption among products. Should not switch back and forth between brand/generics.
Cytomel® (liothyronine)	Synthetic T3
Liotrix® (Thyrolar)	Synthetic T4:T3 in 4:1 ratio (on long-term backorder at time of writing; see thyrolar.com for details)
Compounded Thyroid	Tailored dosage provides a unique ratio of T4/T3 and absence of allergenic fillers, prepared by specialized compounding pharmacists. May be formulated as immediate-release or slow-release. Slow-release products may be more difficult to absorb.
Tirosint®	New liquid gelcap formulation of T4; contains only glycerin, gelatin, and water. May be better absorbed. Less likely to interfere with coffee or proton pump inhibitors.

Synthroid

If you've been started on thyroid medications, you're likely to be familiar with the medication Synthroid. This is the most commonly prescribed medication for hypothyroidism, and in fact, in 2013, Synthroid was the #1 prescribed drug overall in the United States.

The generic chemical name of Synthroid® is levothyroxine, and this is a synthetic version of T4. The T4 hormone is less physiologically active and needs to be converted to T3, the main active thyroid hormone in the body. This type of medication is known as a "pro-drug", as it requires the body to convert it to an active drug.

Most doctors will only prescribe T4 medications, as conventional treatment guidelines state that there is no benefit to taking combination T4/T3 products, and that T4 products are superior.

However, most of these claims are based on studies funded by pharmaceutical companies with a vested interest in promoting the use of their own products.

In my experience as a pharmacist, I've found that while many people do very well on Synthroid, Levoxyl and Tirosint (a new T4 medication that is hypoallergenic), once they are dosed appropriately and stabilized, some people may not be able to properly convert levothyroxine (T4) to liothyronine (T3), the more metabolically active thyroid hormone.

This improper conversion may lead to unresolved thyroid symptoms; including fatigue, depression, weight-gain and hair loss, despite being on T4 containing medications.

Tirosint

People with malabsorption issues may benefit from using Tirosint, a gel cap formulation of levothyroxine. Tirosint has fewer fillers, and the gel cap formulation offers an advantage to the standard tablet. Studies suggest that Tirosint may be better absorbed in people with Hashimoto's, even when taking it alongside coffee and proton pump inhibitors, which are known to interfere with the absorption of levothyroxine.

Thyroid Medications and Thyroid Physiology

Understanding thyroid physiology, I do believe that combination products may be advantageous for many people with hypothyroidism. Some people are not able to properly and efficiently convert T4 to T3. For example, zinc is required to convert T4 to T3, and Hashimoto's patients are often deficient in zinc.

Under stressful situations, T4 gets converted to reverse T3 instead of T3. Reverse T3 is an inactive molecule related to T3 but without any physiological activity - it is a dud that just takes up space! In a case where a lot of reverse T3 is produced, adding a combination product containing T3 will help ensure that the right hormone is getting to the right receptors. Additionally, many patients report that they feel better taking a combination T4/T3 product.

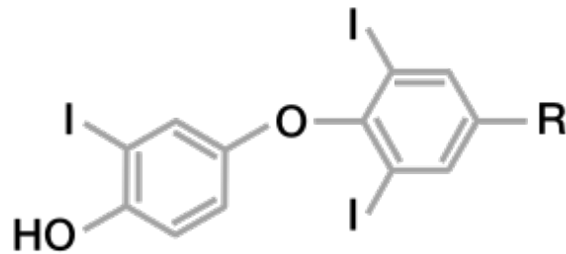
Studies say that 90% of people with thyroid disease can be optimized by T4 only medications and that only 10% continue to have symptoms.

I've found the reverse to be true in MY CLIENTS, but of course I may be biased, as the people who come to seek out my advice are usually those who do not feel their best with the standard care!

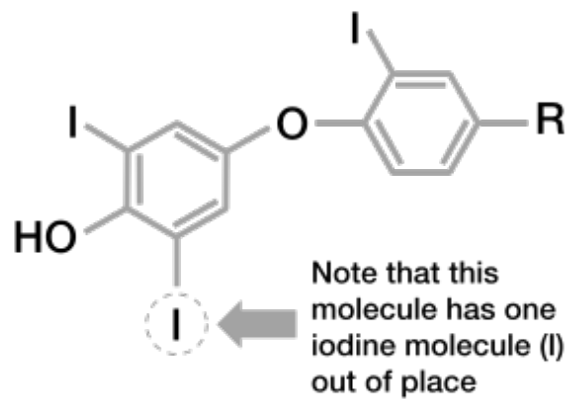
In 2014, Dr. Wilmar Wiersinga, a Dutch endocrinologist and top thyroid researcher stated that "Impaired psychological well-being, depression or anxiety are observed in 5–10% of hypothyroid patients receiving levothyroxine, despite normal TSH levels. Such complaints might hypothetically be related to increased free T4 and decreased free T3 serum concentrations, which result in the abnormally low free T4/free T3 ratios observed in 30% of patients on levothyroxine. Evidence is mounting that levothyroxine monotherapy cannot assure a euthyroid state in all tissues simultaneously, and that normal serum TSH levels in patients receiving levothyroxine reflect pituitary euthyroidism alone."

Dr. Wiersinga suggests that people with specific genetic polymorphisms in thyroid hormone transport may benefit from combination T4/T3 therapy, and that people who continue to have thyroid symptoms despite normal TSH levels may benefit from a trial of T3 medication.

Active T3 Molecule



The Reverse T3 Molecule



National Institutes of Health, a government agency (not funded by pharmaceutical grants), conducted a [clinical trial](#) to see if desiccated thyroid therapy is more advantageous than T4 alone. The authors of the study concluded: "DTE (Desiccated Thyroid Extract) therapy did not result in a significant improvement in quality of life; however, DTE caused modest weight loss and nearly half (48.6%) of the study patients expressed preference for DTE over l-T4 (Levothyroxine). DTE therapy may be relevant for some hypothyroid patients".

Thyroid hormone therapy should be individualized with the patient in mind. Some people report feeling better on natural desiccated hormone and others on compounded T4/T3 medications, while others may feel best taking Tirosint® or another version of synthetic T4.

Natural Desiccated Thyroid

Many patients who did not feel well on conventional treatments have reported feeling much better after switching to a natural desiccated thyroid (NDT) medication like Armour® or Nature-Throid . These medications are derived from the thyroid glands of pigs.

Armour® and other animal organ-derived products are not usually recommended by conventional physicians because of past issues with quality control.

In the past, Armour® has had some discrepancies in the dosages between the batches, as the manufacturer measured the thyroid medications by the content of iodine (which varied and was not necessarily related to the dose of the drug), however as the manufacturing capabilities have improved, current NDT manufacturers now use the actual amounts of T4 and T3 to determine and label the doses. RLC Lab, the manufacturer of Nature-Throid®, and WP Thyroid boasts on its website that Nature-Throid®, has never been recalled for inconsistent T4 and T3 hormones. In contrast, Synthroid was recalled as recently as January 2013, because a product labeled as 150 mcg actually had 75 mcg.

Some proponents of natural thyroid medications claim that the desiccated glands of animals may be the best option, as they also have trace amounts of T1 and T2, which may have undiscovered biological functions.

In contrast, other practitioners report that for some patients, natural thyroid formulations from animal thyroids, such as Armour®, may be perpetuating the autoimmune attack due to the fact they contain thyroglobulin and TPO, and they only recommend compounded and synthetic thyroid medications for people with Hashimoto's (6,7). I have heard the same from multiple pharmacists and patients alike.

If someone starts feeling worse after initially feeling better on desiccated thyroid or has an increase in thyroid antibodies after starting desiccated thyroid, switching to a compounded T4/T3 medication is advisable.

Additionally, some patients may have ethical objections to using animal-derived products like Armour®.

Compounded T4/T3

Compounded T4/T3 products offer another alternative. These medications also have the advantage of being made without fillers such as lactose or gluten, which are present in some thyroid medications and can be problematic for thyroid patients.

However, compounded T4/T3 products need to be prepared by a specially trained compounding pharmacist. These compounds are usually much more expensive and may need to be refrigerated to preserve activity.

Thyroid compounds are usually prepared in the same physiological ratio that is found in Armour®, however, physicians can elect to change the amount of T4/T3, as the compounding pharmacists are literally making the medications from scratch. This can be a huge advantage for those patients who did not feel well on conventional treatments or natural desiccated treatments.

The benefit of the T4/T3 medication is that they can be made devoid of any fillers that people may not tolerate, and they do not increase autoimmunity. Most T4/T3 compounds are immediate release versions, like Armour®, however, compounding pharmacists can also make sustained release versions. Some professionals recommend sustained release formulations so that the hormone is released continuously throughout the day, however these types of formulations may not be absorbed properly by people with Hashimoto's and gut issues.

The downside of T4/T3 compounds is that specially trained compounding pharmacists need to make them, and they do take some time to prepare. Additionally, not all compounding pharmacies are equal, and a specialized process is required to prepare an accurate dose of compounded thyroid medications. Consequently, patients may have to travel out of their way to find a compounding pharmacy.

This is because compounded thyroid medications are dosed in 1/1000th of a milligram. There is a lot of room for error, and I always recommend working with pharmacies that use Professional Compounding Centers of America (PCCA) thyroid starters. PCCA pre-dilutes the thyroid hormones 1000 times, allowing for more precise dosing.

We have a list of compounding pharmacies [here](#).

Questions to ask your compounding pharmacist:

1. What types of fillers are used?
2. What is the source of the materials (I recommend PCCA source materials)?
3. Is the compound slow-release or immediate-release?

Root Cause Rebel Success Story

I got a compounded combined T4/T3 product from a reputable compounding pharmacy in Sydney, Australia. When I started to take the thyroid medication it took some time to find the right dosage, but the rush of energy flooding my body was very noticeable. I recognised mostly how my hair started to grow stronger again, my skin got more elastic and shiny again, and how I had more drive to do exercise and follow up with work projects. The T3 had a profound effect on my mental state - I generally started to feel more focused and happy again.

Matt Dippl, BHSc. TCM, IFM, CMBA
Biohacker | Blogger | Speaker
<http://www.MattDippl.com>

Hypoallergenic Options

Compounded medications, Nature-Throid®, WP Thyroid® and Tirosint® are hypoallergenic options for those with multiple intolerances.

The bottom line: There are many options for thyroid hormone treatment. Each person should work with an open-minded physician to find the thyroid medication that works best for him/her. Thyroid hormone therapy should be individualized with the patient in mind.

Can I be allergic to thyroid hormones?

Allergic reactions and sensitivities to thyroid hormones are rare. Usually, it's the fillers and inactive ingredients in the thyroid hormone preparations as well as the dose that can lead to an adverse, sensitivity or allergic reaction.

However, some people do experience hypersensitivity reactions. These reactions usually present as itching/hives, palpitations, difficulty breathing, skin eruptions, fever and liver dysfunction.

A group of doctors in Turkey published an oral desensitization schedule for people with hypersensitivity reactions which starts the person on 0.01 mcg of levothyroxine, or 1/10,000 of the usual daily dose, and increases the dosage gradually over the course of 2 days, with each dose increase taking place every 30 minutes.

If you feel that you are sensitive to thyroid medications, working with your doctor and compounding pharmacist to gradually increase your dose over time may be helpful in becoming desensitized to the medications.

Levothyroxine oral desensitization protocol

Order	Dose (mcg)	Cumulative dose (mcg)
1	0.01	0.01
2	0.02	0.03
3	0.04	0.07
4	0.08	0.15
5	0.16	0.31
6	0.32	0.63
7	0.64	1.27
8	1.28	2.55
9	2.56	5.11
10	5.12	10.23
11	10.24	20.47
12	20.48	40.95
13	40.96	81.91

Fevzi et al. Successful oral desensitization to levothyroxine. Ann Allergy Asthma Immunol 111 (2013) 138-148

Root Cause Rebel Success Story

“My fatigue made me feel like I was walking against the current of a raging river.... on a good day. The joint pain felt like piranhas gnawing at every joint of my body. The brain fog and short term memory loss felt like I was standing in a dense fog not knowing where to go...

But that was prior to diet change and changing my prescription to Armour Thyroid!”

Changing Between Thyroid Medications

While dose conversions from different medications are readily available (please see the chart on the next page for a proposed dose conversion), there may still be some discrepancies in the dose you receive and how you absorb the medications, so carefully monitor your symptoms and repeat your labs four to six weeks after switching to make sure your body is adjusting properly.

Thyroid Conversion Chart

Eli-Thyroid		Armour Thyroid	Synthroid/ Levothyroid/ Levoxyl	Nature-Thyroid/ Westhroid	Cytomel	Thyrelar
(Immediate Release Capsules, Sustained Release Capsules, +/- Conversion Co-Factors)		(Thyroid Tablets)	(Levothyroxine Tablets)	(Thyroid Tablets)	(Liothyronine Tablets)	(Liotrix Tablets)
Compounded		Desiccated, Porcine	Synthetic	Desiccated, Porcine	Synthetic	Synthetic
T4 (4.2)	T3 (1)	T4/T3	T4	T4/T3	T3	T4/T3
7.6 mcg	1.8 mcg				5 mcg	
9.5 mcg	2.25 mcg	¼ grain (15 mg)	25 mcg (0.025mg)	¼ grain (16.25 mg)		¼ grain (12.5/31 mcg)
19 mcg	4.5 mcg	½ grain (30 mg)	50 mcg (0.05mg)	½ grain (32.5 mg)		½ grain (25/6.25 mcg)
28.5 mcg	6.75 mcg		75 mcg (0.075mg)	¾ grain (48.75 mg)		
33.44 mcg	7.92 mcg		88 mcg (0.088mg)			
38 mcg	9 mcg	1 grain (60 mg)	100 mcg (0.1mg)	1 grain (65 mg)	25 mcg	1 grain (50/12.5 mcg)
42.56 mcg	10.08 mcg		112 mcg (0.112mg)			
47.5 mcg	11.25 mcg		125 mcg (0.125mg)	1 ¼ grain (81.25 mg)		
52.06 mcg	12.33 mcg		137 mcg (0.137mg)			
57 mcg	13.5 mcg	1 ½ grain (90 mg)	150 mcg (0.15mg)	1 ½ grain (97.5 mg)		
66.5 mcg	15.75 mcg		175 mcg (0.175mg)	1 ¾ grain (113.75 mg)		
76 mcg	18 mcg	2 grain (120 mg)	200 mcg (0.2mg)	2 grain (130 mg)	50 mcg	2 grain (100/25 mcg)
85.5 mcg	20.25 mcg			2 ¼ grain (146.25 mg)		
95 mcg	22.5 mcg			2 ½ grain (162.5 mg)		
114 mcg	27 mcg	3 grain (180 mg)	300 mcg (0.3mg)	3 grain (195 mg)		3 grain (150/37.5 mcg)
152 mcg	36 mcg	4 grain (240 mg)		4 grain (260 mg)		
190 mcg	45 mcg	5 grain (300 mg)		5 grain (325 mg)		

Note: these conversions are approximate measures

Survey Says...

A survey of 2232 Root Cause readers found the following results regarding which medications and which TSH ranges made the participants feel better or worse.

Please use these results to guide your treatment plan, but also remember that you are a person and not a statistic. Just because most people felt better on a particular medication, doesn't mean that this will be your ideal medication!

Medication taken	Felt Better	Felt Worse	Did not notice difference
Armour	59%	19%	23%
Compounded T4/T3	55%	11%	33%
Cytomel	52%	12%	36%
Levoxyl	25%	25%	50%
Nature-Throid	56%	11%	32%
Synthroid	43%	31%	26%
Tirosint	26%	8%	66%
WP Thyroid	32%	5%	62%

Right Dose

The goals of medication therapy are to relieve thyroid symptoms and get the TSH, Free T4, and Free T3 in the normal range.

Dosing

Usually the patient is started on a low-dose thyroid medication, and the dose is gradually increased to normalize TSH, free T4, and free T3. This is to avoid shocking the body with a dramatic change and to determine the appropriate amount needed.

After the initial starting dose, the TSH and free T4/T3 are measured again in four to six weeks to see if they have improved. If the lab ranges are still not at goal, the dose is increased and labs repeated in another four to six weeks.

Synthroid® (Levothyroxine): 1.7 mcg/kg daily, doses are increased by 25 mcg every four to six weeks.

Armour®, Compounded T4/T3: Start at 30 mg, increase by 15 mg every six weeks.

Nature-Throid®: Start at 32.5 mg, increase by 16.25 mg every six weeks.

Starting thyroid medications

“Start low and go slow”

Thyroid medications need to be started at a low dose as not to overwhelm the body, and increased gradually over time, according to symptoms and thyroid labs.

T4 Containing medications

T4 containing medications are usually started at a dose of 25-50 mcg per day, although some clinicians may start with a dose as high as 1.7 mcg/kg per day.

The medications are then adjusted to the target dose by 25 mcg per day every 4 to 6 weeks, depending on the person’s symptoms and thyroid function tests. A maximum dose of 300 mcg/day is recommended.

In the case of severe hypothyroidism the doctor may choose to adjust the dose every 2 weeks, to get to the target dose faster.

For people who are elderly, have cardiac problems or are otherwise sensitive to thyroid medications, a lower initial dose, such as 12.5-50 mcg/day may be a preferable starting point, and the dose may be slowly increased by 12.5 mcg/day every 6 to 8 weeks.

Armour, Nature-Throid and T4/T3 Containing Medications

Armour, Nature-Throid and T4/T3 medications are started at 30 mg daily, and increased by 15 mg/day every 6 weeks.

Lower starting doses and a slower titration schedule may be indicated for people who are elderly, have long-standing disease or have cardiac risk factors.

If a person has fails to respond to a dose of 180mg per day, malabsorption, drug interactions, or adherence issues should be suspected.

Cytomel and T3 only medications

Cytomel, liothyronine and T3 only medications are usually started at 25 mcg by mouth daily, increasing by 12.5-25 mcg/day every 1-2 weeks. Doctors may choose to increase by a lower dose of 5 mcg every 1-2 weeks for elderly individuals.

What is normal TSH?

Most endocrinologists consider a “normal” TSH to be simply within the reference range, but many patients report “feeling like sloths” with a “normal” TSH of 2.5 µIU/L! Some may need to increase the dose until the TSH is at or below 1 µIU/L.

In a survey I conducted of 2000+ of my readers with hypothyroidism, 67% said that they felt “worse when their TSH” was above 2 µIU/L, while most felt best with a TSH between 1 and 2, and some reported that they needed their TSH to be under 1 µIU/L to feel their best.

You should know that thyroid medications containing T3 (e.g., Armour®, compounded T4/T3, Thyrolar®, and Cytomel®) can skew thyroid function test results.

When testing thyroid function, tests should be done **before** the daily dose of medication is taken. As these medications are generally taken in the morning, individuals should postpone their medication until after the blood test has been performed.

Root Cause Rebel Medication Report

Dana Trentini from www.hypothyroidmom.com shared her personal experience of recovery from a devastating mismanagement of thyroid medications.

“I was diagnosed with hypothyroidism the year following the birth of my first son in 2006. Low thyroid symptoms overtook my life. I was overwhelmed with a fatigue so intense that there are no words to describe it. The pregnancy weight was impossible to lose. My hair was falling out. The heels of my feet were cracked and my scalp itched. My legs were numb to the touch. Unusually heavy menstrual bleeding, chronic constipation, scary anxiety, and constant infections plagued me. Kidney stones landed me in the emergency room. A healthy woman prior to pregnancy, now I had blood levels indicating I was at high risk for a heart attack and pre-diabetic. What had happened to me?

I trusted my doctors and followed their thyroid drug protocol to the letter, never once thinking they might not know everything there was to know about hypothyroidism. I trusted them as the experts, especially when I became pregnant again in late 2008.

I would later learn that my Ivy League medical school trained and top awarded doctors did not know enough about hypothyroidism, especially the dangers of hypothyroidism in pregnancy. Under their care my TSH, the gold standard for measuring thyroid function in mainstream medicine, reached levels far above the recommended reference range for pregnancy, endangering the life of my fetus, and I miscarried.

How could I have trusted my doctors unquestioningly and not been a better advocate for my child? I will live with that regret for the rest of my life.

My life changed when I found a great doctor. I found a doctor who was open to testing not just TSH, but also Free T4, Free T3, Reverse T3, and thyroid antibodies. She listened, really listened to me. She understood that I was much more than the lab numbers on the page. She was also open to exploring the thyroid hormone replacement medications beyond T4-only Levothyroxine drugs to find what was right for me. I'm so grateful she did, because thanks to a combination of Nature-throid and compounded time-release T3 I am feeling fabulous”

After optimizing medications and lifestyle changes, Dana was able to have a healthy baby at age 40 and started her thyroid advocacy blog www.hypothyroidmom.com.

Right Time And Right Way

Are You Absorbing Your Thyroid Medications?

In my days of working as a community pharmacist, I was always counseling people who were taking thyroid medication on the effects of foods, other medications and supplements, on the absorption of thyroid hormones.

Thyroid medications, when taken orally, are notorious for being poorly absorbed by the body. Only about 40-80% of thyroid hormone is normally absorbed in the body, and various factors can further reduce the amount of thyroid hormone absorbed!

Absorption of thyroid hormones occurs in the jejunum and upper ileum of the small intestine and can be impaired by a variety of factors, including foods, beverages, medications, supplements and internal factors.

Stomach acid

Absorption of thyroid hormones requires the presence of stomach acid. Consequently impaired absorption may be seen in patients with low levels of stomach acid (hypochlorhydria) and in those who do not make any stomach acid (achlorhydria). This is very common in those with thyroid disorders and Hashimoto's!

Furthermore, medications and supplements that suppress stomach acid may cause impaired absorption of thyroid hormones, including antacids, proton pump inhibitors, calcium, magnesium-aluminum and iron.

I always recommend spacing out calcium, iron and magnesium supplements by at least **4 hours** from thyroid medications.

As low stomach acid has been found to be an issue in many cases of hypothyroidism, and low stomach acid can have identical symptoms to acid reflux, I always recommend a careful re-evaluation of the use of acid suppressing medications for acid reflux in everyone with Hashimoto's and hypothyroidism.

Some of my clients and readers with low stomach acid have found that taking thyroid medications with hot lemon water (the juice of one lemon in a glass of water) or with apple cider vinegar (one teaspoon per 8 oz. glass of water) can help provide enough acidity to aid with the absorption of thyroid hormones.

Drug Interactions

Certain medications can alter thyroid hormone metabolism and result in an increased clearance of thyroid hormones by the liver.

These medications are processed by the same liver enzymes that process thyroid hormones, and include the medications rifampin, phenytoin, carbamazepine and a class of medications known as barbiturates (phenobarbital being the most commonly prescribed).

These medications can cause mild, usually self-limited alterations in thyroid hormone levels in people without thyroid dysfunction who do not take thyroid medications, however, those of us who take thyroid medications may see big alterations in levels and may need to increase their doses of thyroid medications after starting one or more of these medications!

Bile acid sequestrant drugs that are used for high cholesterol and sometimes diarrhea (cholestyramine, colestipol, colesevelam) reduce the liver's reabsorption of bile from the gut, and may reduce the absorption of thyroid medications and prevent the liver from recirculating T4, causing thyroid medications to be cleared out of the body too quickly.

Some people that take these medications may need to double their dose of thyroid medications!

Getting your TSH, Free T3, and Free T4 levels tested within 2-6 weeks of starting these interacting medications will help you and your doctor determine if an adjustment of thyroid medication dosage is needed.

Estrogen and Thyroid

Oral estrogens such as those taken for birth control or hormone replacement therapy cause an increase in thyroxin-binding globulin. In people taking medications, starting estrogen may result in an elevation of TSH, and dose adjustments may be necessary. The same effects are not seen with transdermal options like patches and creams, which are not processed by the liver.

Stimulant medications

Stimulant medications that mimic the sympathetic nervous system, including amphetamine, methamphetamine, Ritalin, pseudoephedrine and ephedrine can have

additive effects with thyroid hormones, potentially exacerbating unpleasant side effects like palpitations or irritability.

Medications that Interact with Thyroid Medications

- Antacids
- Proton Pump inhibitors
- H2 receptor blockers (Pepcid, famotidine)
- Calcium carbonate
- Tums
- Sucralfate
- Aluminum hydroxide
- Rifampin
- Phenytoin
- Carbamazepine
- Barbiturates
- Estrogen
- Renagel (Sevelamer carbonate)
- Stimulant medications (amphetamine, Ritalin, pseudoephedrine).

This is not a fully inclusive list. Be sure to check with your pharmacist whenever you are starting a new medication!

Food

Food can impair the absorption of thyroid hormones, so this is why it's always recommended to take thyroid hormones on an empty stomach.

A person with normal digestive function can take thyroid medications 15-30 minutes prior to breakfast and the medications will be well absorbed, but some people may need to postpone breakfast by a minimum of 60 minutes after taking thyroid medications for proper absorption.

One study even found that some people had to wait as long as 5 hours to eat breakfast to properly absorb their thyroid medications!

I recommend keeping your thyroid medications at bedside, and taking them as soon as you wake up (be sure to keep them out of reach of children and pets).

Italian researchers found that their morning espresso loving patients did not absorb their thyroid medications correctly. Having coffee with thyroid medications can significantly alter the absorption of thyroid medications. Coffee lowers the intestinal absorption of both inorganic and organic compounds, and seems to physically interact with thyroid medications.

One person who was drinking espresso within 10 minutes of thyroid medications had a consistently elevated TSH between 13 and 18 $\mu\text{IU/L}$. The same person, on the same dose of medication, was made to wait one hour to have her coffee, and took her medication with a full glass of water instead. Her TSH was testing between 0.03-0.1 $\mu\text{IU/L}$ for 15 months!

Interestingly, an additional group of Italian researchers found a way for their espresso loving thyroid patients to have their coffee with their thyroid medications. They found one specially formulated thyroid medication that may withstand the effects of coffee - Tirosint, which is a gel cap formulation of T4 (levothyroxine), showed adequate absorption, even when taken with coffee!

Other foods that may interfere with thyroid medication absorption include soy, grapefruit juice, cottonseed meal, walnuts, and dietary fiber.

Gut Dysfunction

Gut disorders including celiac disease and infections like H. Pylori can interfere with absorption of thyroid medications. Many people with Hashimoto's may have silent gut infections, and gut infections may actually trigger autoimmune thyroid disease! Some people have been able to get their thyroid conditions into remission by treating gut infections! I discuss the gut and thyroid connection in greater detail in my book: [Hashimoto's: The Root Cause](#).

Gluten Free Medication Options

Many prescription medications can contain gluten. As most prescription medications are dispensed in pharmacy bottles, most of us do not get to scan the ingredient list.

Luckily, most thyroid medications are gluten free, but we need to be careful with the various generic brands of levothyroxine (only 2 are gluten-free), as well as Synthroid.

The manufacturer of Synthroid is not able to guarantee gluten-free status due to cross contamination issues, and I have heard from multiple patients with Hashimoto's and/or celiac disease, who were following a gluten-free diet, that they *have had similar symptoms to gluten exposure when taking Synthroid*. At the time of writing this book, AbbVie, the manufacturer of Synthroid is working to resolve this issue.

As I mentioned earlier, I've surveyed 2232 of my readers, and have found that the gluten-free diet is by far one of the most helpful interventions - even more helpful than taking thyroid medications, for many people! It's a bit ironic that Synthroid was the #1 prescribed medication in the US in 2013, for a condition that is largely related to gluten sensitivity, yet it can be cross contaminated with gluten!

I'm doing my best to keep this book short, sweet and focused on medications, but if you'd like more information on the gluten-thyroid connection, please see my blog www.thyroidpharmacist.com/blog and my book [Hashimoto's: The Root Cause](#).

Gluten-Free Thyroid Medications

- Armour
- Cytomel
- Levothyroxine (Lannet, Mova brands only)
- Levoxyl
- Nature-Throid
- Tirosint
- WP Thyroid (formerly Westhroid Pure)
- Most compounded thyroid medications (check with your pharmacist)

I also recommend the following website as a resource, it is managed by a clinical pharmacist and full of gluten-free medication resources:

<http://www.glutenfreedrugs.com>

The fact that you're not absorbing your medication properly could be a hint to the root cause of your thyroid condition.

A recent study published in the Journal of Clinical Endocrinology and Metabolism found that people with lactose intolerance needed higher doses of thyroid medication to get to an optimal TSH.

The dairy sugar, lactose, can be an issue for people with Hashimoto's, and even tiny amounts of it can have a profound impact on our ability to absorb thyroid medications. Worst of all, some thyroid medications actually contain lactose, potentially inhibiting their own absorption!

The researchers found that the average person with Hashimoto's required a median dose of 1.31 mcg/kg/day of levothyroxine to get to an average TSH right around 1 mU/L (that would be right around 90 mcg of levothyroxine for a 150 pound person), while a person with *Hashimoto's and lactose intolerance* who continued to consume lactose needed a dose of 1.72 mcg/kg/day to reach the same goal (that would be like 116 mcg of levothyroxine for the same 150 pound person - a big difference).

Furthermore, patients who had another gut disorder, in addition to lactose intolerance, required an even higher dose to get to their goal TSH - 2.04 mcg/kg/day, or around 140 mcg for a 150-pound person, or 1.5 times the average dose!

A 2014 study by Asik and colleagues found that lactose intolerant Hashimoto's patients who were taking levothyroxine showed a decrease in TSH after lactose restriction.

Whenever I see people who's TSH levels fluctuate, and who have a hard time adjusting their medication to the right level, I always suspect lactose intolerance unless the person is already dairy free. I imagine the changes in TSH occur as a result of the varied amounts of lactose a person may have on various days.

A 2006 paper in the journal "Thyroid", described one woman with lactose intolerance and Hashimoto's, and determined that lactose intolerance was a rare occurrence in causing malabsorption of thyroid medications, however, a newer study, done in 2014 by Asik and colleagues, tested 83 Hashimoto's patients for lactose intolerance and found lactose intolerance in **75.9%** of the patients!

38 of those patients were instructed to start a lactose free diet for 8 weeks, and the researchers found that over this time, the patients' TSH dropped, which meant they were absorbing their thyroid medication better.

So this lactose thing gets even more interesting...

For some lactose intolerant people, even tiny amounts of lactose that are present in thyroid medications can be an issue, resulting in impaired absorption of thyroid medications. **Yes, thyroid medications could be sabotaging their own absorption if they contain even miniscule amounts of lactose!**

So, if you are someone that can't get his/her TSH into your sweet spot (TSH should be between 0.5-2 mU/L for most people to feel their best) despite taking escalating doses of thyroid medications, consider lactose intolerance and the possibility that the lactose in your diet or even in your thyroid medication may be inhibiting its absorption.

Breaking Down Lactose

As my community is full of extremely smart and motivated people interested in finding solutions, someone is sure to ask: "What about taking Lactaid (a supplement that contains *lactase*, an enzyme that breaks down lactose) with your thyroid medications? Will that help with the absorption of the medication?".

This is a really interesting question... In theory, it should work, but I have not tested that theory yet. If anyone has had experience with taking Lactaid in conjunction with your lactose containing thyroid medications, I'd love for you to share your experience.

Please leave a comment on my blog post <http://thyroidpharmacist.com/articles/the-dose-of-your-thyroid-medication-can-uncover-your-root-cause> with your experience!

As far as diet, I have personally seen tremendous improvements in my health and the health of clients and readers on a dairy free diet, so this is something that I recommend across the board for people with Hashimoto's.

LACTOSE CONTAINING THYROID MEDICATIONS

- Synthroid
- Euthyrox
- WP Thyroid*
- Nature-Throid*
- Most generic brands of levothyroxine
- Some compounded medications - check with your pharmacist

** contain trace amounts of lactose*

LACTOSE FREE THYROID MEDICATIONS

- Tirosint
- Armour Thyroid
- Cytomel
- Levoxyl
- Some compounded medications - check with your pharmacist

Medication Tips

Of all of the T4 containing medications, Tirosint has the fewest fillers that may impair absorption, this medication was specifically designed for this purpose. I've had many clients and readers comment on how they felt much better on Tirosint compared to other versions of levothyroxine. Of course, many people do not feel good on T4 only medication, and may require a T4/T3 combination medication.

Of all of the T4/T3 combination medications, WP Thyroid has the fewest fillers that can impair absorption, but it too, contains small amounts of lactose.

Armour thyroid does not contain lactose, but contains corn-derived ingredients that can be problematic in corn sensitive individuals.

Depending on the sources of the raw materials, compounded T4/T3 medications may be made free of most fillers, including lactose.

Thyroid hormones compounded in cocoa butter troches that are used sublingually (under the tongue) offer an alternate route of administration of thyroid hormones that may be better tolerated by those with absorption issues.

Thyroid Morning vs. Bedtime Dosing

While the standard timing for taking thyroid medications is first thing in the morning, with a glass of water and waiting 30 minutes to one hour before eating food or other medications to prevent absorption interference, a 2007 study explored the effect of evening dosing of levothyroxine for 12 women.

They found that bedtime dosing helped to lower TSH and increase levels of T4 and T3 throughout the day. In people who have normal, healthy thyroid function, TSH levels actually increase at bedtime, telling the body to start making more thyroid hormone, therefore taking levothyroxine at bedtime makes sense.

While most people should be able to optimize thyroid hormone levels by taking the medication first thing in the morning, nighttime dosing may be a possible option for those who have trouble normalizing their thyroid function with the standard morning dose.

Levothyroxine has a very long half-life, and needs to be converted to the active T3 in the body, so the bedtime dosing is less likely to result in keeping people awake at night, however, using a combination T4/T3 medication at bedtime may result in trouble sleeping for some.

TIPS FOR IMPROVING YOUR RESPONSE TO THYROID MEDICATIONS

1. Consider testing for lactose intolerance or going lactose free: There's a good possibility that if you have Hashimoto's, you also have lactose intolerance. You can either put yourself on a lactose free diet as a trial, or have your doctor do a test for lactose intolerance. If you are someone that needs to see a test to take action (don't worry, so was I), you can ask your doctor to order a hydrogen breath test for lactose intolerance or a lactose tolerance blood test for you.

2. Consider having functional medicine tests for the following root causes: SIBO (Bacterial Overgrowth Breath Test - Genova KIT), parasites (GI Pathogen Screen with H. pylori Antigen - BioHealth KIT) and other gut infections (GI Effects Gastrointestinal Function Comprehensive Profile (One day collection) - METAMETRIX KIT). Your functional medicine practitioner can order these tests for you, or if you are someone who wants to take charge of your own health, you can self-order them [HERE](#).

Other Factors Contributing to Medication Absorption

A 2012 Polish study by Ruchala and colleagues reported that thyroid patients who need more than 2 mcg/kg/day of levothyroxine with an increased TSH should be suspected of an absorption disorder. This disorder could be caused by lactose intolerance, celiac disease, atrophic gastritis, an H. Pylori infection, and inflammatory bowel disease or parasite infection.

Interestingly, in my experience, many of these are also potential root causes of autoimmune thyroid disease, and addressing some of these issues has helped people get into remission.

Assessment: Figure out your mcg/kg dose of thyroid medication

(Math refresher, take your current dosage of medication, then divide it by your weight in kilograms. To figure out your weight in kilograms, take your weight in pounds and divide it by 2.2).

Use the handy conversion chart on page 35 if you take NDT or compounded thyroid medications, to determine your approximate equivalent levothyroxine dose.

Key:

If your TSH is around 1, and your dose is 1.31mcg/kg or less: your remaining triggers are likely to be outside of your gut

If your TSH is >1, and your dose is 1.31mcg or higher: suspect that you have lactose intolerance

If your dose is 2 mcg/kg or more: consider lactose intolerance and another gut disorder that could be inhibiting your medication absorption and potentially be the root cause of your condition.

***Please note, the TSH is not the only important thyroid test, just the one that was used in research.*

Root Cause Success Story

Pujah is a 46 year old woman with chronic depression, and terrible fatigue that required a nap each afternoon, leaving her wanting to go to bed by 9 pm. She'd experienced a 30-pound weight gain over the past 2 years in spite of no major changes in her diet or exercise routine, and she frequently feels cold. Even when it's warm outside, she needs to wear a sweater.

Her primary care doctor told her that her thyroid was normal, with a TSH of 4.2, and declined to put her on medications, because the upper cut-off for "normal" is 5.0, and instead recommended she begin an antidepressant.

Pujah came to me worrying that maybe her symptoms were just caused by depression, and she was considering starting the antidepressant, though she'd had a bad experience with one years ago, making her reluctant to try again.

I repeated Pujah's labs as it had been several months since her last thyroid labs, and levels can change in that short a time. Also, only her TSH had been checked, whereas I would usually check TSH, free T3, free T3, thyroid autoantibodies, and sometimes Reverse T3 as well.

Labs results showed a TSH of 5.2, and low free T3, as well as elevated thyroid autoantibodies, suggesting an autoimmune component to her thyroid problem, giving her the clear diagnosis Hashimoto's thyroiditis.

I started Pujah on the lowest dose of Armour thyroid, 15 mg, and after 2 weeks since she was tolerating it well but not seeing dramatic symptom improvement, raised her to the next dose of 30 mg. After another few days she noticed improvement in her energy and mood, and a thyroid labs recheck at 3 weeks showed her now at a TSH of 3.8, with still low free T3. We raised the dose to 45 mg, and after another 2 weeks, up to 60 mg. By now, Pujah was much more energetic, able to skip her nap, and had noticed her carbohydrate bingeing was no longer a problem now that she had more energy. She also noticed that she no longer felt cold all the time, and her mood was much better.

From Aviva Romm MD, Integrative-Functional Medicine MD
<http://avivaromm.com/>

Working With Your Doctor to Get on the Right Type/ Dose of Medication

Many doctors may be averse to prescribing thyroid medications to a person with subclinical hypothyroidism, increasing the dosage of thyroid medications or switching to a T4/T3 containing medication.

Physicians may worry about using T3 containing medications or increasing the doses of thyroid medications due to concerns about heart palpitations and increased risks of osteoporosis, which may result from a person who has excess levels of thyroid hormones.

According to Carter Black, RPh, who has been a practicing pharmacist since the 1970's, the 80's brought T-3 into a negative light.

Weight loss clinics started prescribing Cytomel (T-3) along with amphetamines and liquid diets for people without thyroid disease. As you can imagine, this combination given to an overweight person with a normally functioning thyroid often created a dangerous situation.

Patients were admitted into emergency rooms with life threatening symptoms of high fever, palpitations, labored breathing, dehydration, delirium, nausea, and vomiting and even coma.

This can be a very difficult clinical situation to manage, and death can result. People exposed to this cocktail were at risk for future problems of thyroid management (alternating hyperthyroid and hypothyroid,) cardiac damage and severe depression.

Of course as a pharmacist, I would like to point out that using thyroid medications to induce weight loss for people without thyroid disease is completely inappropriate.

Doctors were essentially inducing hyperthyroidism in people to induce weight loss. Since that time, the FDA has placed a “black box warning” on all thyroid medications, that they should not be used for obesity/weight loss in people with normal thyroid function, and that higher doses may cause life-threatening toxicity, especially when given with sympathomimetic medications like as a result of this.

A “black box warning” is the strictest **warning that can be placed in the labeling of prescription drugs** when there is reasonable evidence of serious risks associated with the drug.

Many of today's practicing endocrinologists witnessed the effects of T3 for weight loss induction first hand as young residents and medical students early in their training. One can certainly understand a doctor's aversion to T3 or T4/T3 combinations because of past history of inappropriate use.

Most doctors really care about your safety and want to do the best by their patients.

However, in their effort to reduce the potential adverse reactions due to *overtreatment*, many individuals continue to experience thyroid symptoms because of *undertreatment*.

New medication related research is coming out!

New research is coming out that supports the appropriate use of T3 containing medications in helping people with thyroid disease. In 2013, the National Institute of Health published a study with using NDT, Dr. Wiersinga published an article on using T3 in selected patients in 2014, while Rush University in Chicago hosted a continuing education event about the use of combination therapy for people who continue to have thyroid symptoms despite T4 therapy in 2015.

A doctor who is familiar with clinical trials that have shown T3 and NDT can be safe and effective when used appropriately, is more likely to feel comfortable with prescribing these medications.

However, your doctor may not be aware of this research, and sometimes, it may help for you to make him/her aware of the latest and the greatest in thyroid care. After all, he/she may need to keep up with hundreds of different health conditions.

In working with your doctors, it's always helpful to come prepared and to be able to assertively advocate for your case.

I recommend taking the time to write out your list of symptoms, concerns and questions for your doctor 24 hours before your appointment.

Bring supporting materials, such as abstracts of studies that may support your case, your current medications and supplements (so you know the exact dose and kind), your past lab tests, and any recommendations you may have received from another practitioner, like a pharmacist or nutritionist.

We often have questions and concerns in mind but may forget them when we are sitting in the doctor's office. Sometimes this may be due to brain fog, stress, feeling rushed,

delays at being seen, or perhaps an intimidating demeanor that we pick up from the doctor or staff.

Remember to bring your notes with you!

On the next page is a letter my clients have found helpful in working with their doctors.

For a printable version of this letter, please sign up for our support emails at www.thyroidpharmacist.com/gift

Dear Physician,

In recent years, The National Academy of Clinical Biochemists indicated that 95% of individuals without thyroid disease have TSH concentrations below 2.5 μ IU/L, and a new normal reference range was defined by the American College of Clinical Endocrinologists to be between 0.3- 3.0 μ IU/ml in 2012. (1)

In speaking with other thyroid patients, I have found that many of them didn't feel better until their TSH was between 0.5-2.0 μ IU/ml.

I understand that most labs have not adjusted to the new range in the reports they provide to physicians, and have kept ranges as lax as 0.2- 8.0 μ IU/ml.

Therefore, although my recent TSH reading of _____ may be considered normal by lab standard, I am currently experiencing the following symptoms which may be associated with low thyroid function.

Drowsiness

Hair Loss

Cold Intolerance

Inability to Lose Weight

Sadness

Mental Fog

Forgetfulness

Joint Pain

Constipation

Kindly consider increasing my dosage of medications.

I will follow-up with lab testing in 6-8 weeks and report any changes in functioning.

Your patient,

Reference:

(1) 2012 Clinical Practice Guidelines for Hypothyroidism in Adults: Available to print at:
https://www.aace.com/files/hypothyroidism_guidelines.pdf

Some doctors may be too set in their ways, and may not be willing to adjust their prescribing habits for you. They may feel very uncomfortable with using anything besides Synthroid and may be wary of treating a person with a TSH below 10 μ IU/ml.

If you are continuing to struggle with symptoms of undertreatment of thyroid disease, it may be time for you to seek a second opinion from a doctor who is familiar with prescribing a variety of thyroid hormones, not just Synthroid, and has experience treating people with subclinical hypothyroidism.

I would recommend that you use the [Thyroid Pharmacist Doctor Database](#) as a starting point to finding a new doctor, and you can also work with your local compounding pharmacist (use the [Thyroid Pharmacist Compounding Pharmacy Database](#)), to see if he/she has a recommendation for the most knowledgeable thyroid doctor in your area.

You may be surprised that the doctors with the most positive feedback from the thyroid community are usually not endocrinologists!

It's advisable that you call the doctor's office before you make your appointment to be sure that he/she has experience with using a variety of thyroid medications. You can ask the staff if the doctor prescribes Armour, Nature-Throid, compounded thyroid medications, Tirosint or Cytomel.

Don't resort to ordering meds online, as these medications can be counterfeit and unsafe. Additionally, medications are medications, and they require that someone is monitoring your lab tests!

In other cases, you may need to find a doctor who is more progressive with thyroid medication options, and may be willing to explore additional treatment options like the Listecki-Snyder protocol developed by compounding pharmacist Bob Listecki, RPh., which uses an altered dose of T4 and T3, as well as the Circadian T3 method, popularized by thyroid advocate Paul Robinson.

Please see the Appendix section of this book for interviews with pharmacist Bob Listecki and patient advocate Paul Robinson about their respective protocols.

Assessment: Which of the Following Do You Experience?

Please use the following questionnaire to help you reflect on your current medication regimen.

Symptoms of Under treatment	Symptoms of Overtreatment
<input type="checkbox"/> Tangled Hair	<input type="checkbox"/> Irritability
<input type="checkbox"/> Hair Loss	<input type="checkbox"/> Agitation
<input type="checkbox"/> Eyebrow Thinning/Loss	<input type="checkbox"/> Mood Swings
<input type="checkbox"/> Puffy Face	<input type="checkbox"/> Restlessness
<input type="checkbox"/> Brain Fog	<input type="checkbox"/> Palpitations
<input type="checkbox"/> Sadness/Apathy	<input type="checkbox"/> Heat Intolerance
<input type="checkbox"/> Fatigue	<input type="checkbox"/> Rapid Heart Rate
<input type="checkbox"/> Cold Intolerance	<input type="checkbox"/> Scant Periods
<input type="checkbox"/> Weight Gain	<input type="checkbox"/> Weight Loss
<input type="checkbox"/> Joint Pain	<input type="checkbox"/> Insomnia
<input type="checkbox"/> Heavy Periods	<input type="checkbox"/> Excess Sweating
<input type="checkbox"/>	

1) What is your TSH?

2) Is it optimal for you?

3) What is your Free T4? Is it in the top half of the reference range?

4) What is your Free T3? Is it in the top half of the reference range?

5) Are you on the correct medication for you?

6) Do you have a physician that can adjust your dose of medication and who is willing to explore alternate medication options as necessary?

7) Do you take your medications on an empty stomach?

8) What is your mcg/kg dose of medication?

9) Does this dose produce an optimal TSH result for you?

10) What does your dose of medication suggest about your root cause?

Are Medications Forever?

Most physicians and endocrinologists will say that in Hashimoto's, hypothyroidism is irreversible and ends with complete thyroid cell damage, leading to a lifelong requirement of thyroid hormone medications.

Hormone supplementation in conventional medicine is considered lifelong, making Hashimoto's a chronic condition, dependent on the traditional medical system with a continued need for physician visits, lab monitoring, and daily medication, with the potential of dose escalation as more thyroid tissue destruction occurs.

However, this isn't true! It has been reported that thyroid function spontaneously returned in 20% of patients with Hashimoto's.

These individuals will return to normal thyroid function even after thyroid hormone replacement is withdrawn. (1,2)

How?

Studies show that once the autoimmune attack ceases, the damaged thyroid has the ability to regenerate. Thyroid ultrasounds will show normal thyroid tissue that has regenerated, and the person will no longer test positive for TPO Antibodies. (3)

Lifestyle interventions can also help with reducing TPO antibodies, reversing hypothyroidism and Hashimoto's, and preventing other diseases - and they make most people feel better. Some people may be able to reduce and eliminate the need for thyroid medications when the autoimmune attack ceases and the thyroid gland is able to regenerate.

This regeneration may often be missed in adult patients, because they are assumed to have hypothyroidism for life, and antibodies and ultrasounds are not usually repeated after the initial diagnosis.

In addition to the ultrasound and TPO antibodies, a test can be done by administering TRH (Thyroid Releasing Hormone), which will cause an increase in T3 and T4 if the thyroid has recovered. This test will help determine if the person can be weaned off thyroid medications safely. (2)

While this information is readily available in the scientific literature, most physicians do

not attempt to administer TRH in an effort to see if patients could be weaned off of their thyroid medications.

Despite the 20% spontaneous recovery rate, most physicians tell their patients that thyroid medication is lifelong. Perhaps it is easier and less expensive to have someone on pills for life, instead of running tests and attempting to taper down a medication. In some cases, a person might become hyperthyroid, which necessitates a reduction in medication dosage.

In other cases, the medication gets built into our physiology due to hormonal feedback, and internal hormone synthesis "turns off" because there is enough supplemental hormone circulating. If this occurs, a TRH (thyroid releasing hormone) test should be done to see if the thyroid function has recovered.

Most of my work has focused on methods for reducing the autoimmune attack on the thyroid gland.

I have found that Selenium 200 mcg, a "caveman" like diet, avoidance of toxins, stress reduction, and addressing infections (which are often hidden) can help reduce the autoimmune attack on the thyroid gland. For more information, please see my website www.thyroidpharmacist.com and book Hashimoto's: The Root Cause.

Medications Versus Lifestyle Interventions

Medications are a great weapon in the arsenal available to overcome Hashimoto's, and they can be of tremendous benefit while we fix the issues contributing to our autoimmune thyroiditis.

For those already taking thyroid supplements, it is crucial never to stop the medication abruptly. Abrupt cessation can lead to severe hypothyroid symptoms and cause a rapid escalation of TSH, leading to more thyroid damage. Gradual tapering of the medication is necessary and should only be done under the supervision of a physician.

I know that some people refuse to take thyroid medications and may feel that taking thyroid medications is like giving up, but that is not the case! Think of medications as one of the tools in your toolbox for overcoming Hashimoto's. We can use medications to help us feel better while we work everything else out.

Do not think of medications as a life sentence. In some cases, you may be able to get off them once you fix the "leaks" in your body that are contributing to the autoimmune

destruction of the thyroid. If your TSH is elevated for a prolonged period of time, not taking thyroid medications can actually be harmful, and may be hindering your recovery.

If you have elevated thyroid antibodies, an elevated TSH, or thyroid symptoms, you may want to talk to your doctor about thyroid medications. There is no need to suffer while you search for the root cause of your condition.

In summary, getting the right person on the right kind of thyroid medication, given at the right dose, at the right time and in the right way, can make a tremendous difference in your symptoms, especially in energy, weight and hair appearance.

Appendix A

Listecki-Snyder Thyroid Protocol

Pharmacist Bob Listecki is someone that I met at the beginning of my health journey. I was working in pharmaceutical sales, visiting pharmacists to tell them about the benefits of various new medications.

I walked into Glen Ellen Pharmacy and started telling Bob about asthma products the company I worked for made. Bob listened, and then interrupted, “You know, there are ways to treat asthma naturally.” I was intrigued.

At the time, I had just started with lifestyle changes for Hashimoto’s. It was April 2011. I had been gluten and dairy free for a little over 2 months, and had started to see some real changes in my health. After such a positive response to my first venture with natural healing, I was all ears.

Bob told me about the role of the bacteria in our gut and their connection to chronic diseases, and introduced me to the world of probiotics. We talked about the challenges of thyroid conditions and natural health and I walked out of his pharmacy a few hours later with a bag of probiotics, another piece of my puzzle.

I have always thought of Bob as an innovator with a wealth of knowledge, so I wasn’t surprised when I came across the Listecki-Snyder Protocol in the International Journal of Pharmaceutical Compounding (IJPC) in late 2012.

This is a specialized protocol for compounded thyroid medications that delivers a physiologic or bio-identical ratio of T4:T3 for improved patient outcomes.

I had the pleasure of interviewing Pharmacist Bob last year about his innovative protocol.

Background Information

For those of you new to the thyroid, the thyroid gland has two main physiologically active hormones. T3, and T4.

Synthroid, the most popular thyroid medication on the market, contains only T4, which is a precursor to the more physiologically active T3 hormone.

In theory, T4 is a pro-drug and people should convert it to the more active T3 - it's a simple chemical process of removing one iodine molecule of the hormonal structure, but there are a lot of reasons that some individuals may not be able to properly convert T4 into the more active T3. (More in my post [WHICH MEDICATION IS BEST](#))

This can be a problem, because T3 is our “go” hormone. It helps us to create beautiful healthy hair, maintains our metabolism and helps us maintain energy levels.

While some people feel great and look great taking just T4 containing medications, (think the beautiful actress Sophia Vergara, a spokesperson for Synthroid), many of us continue to have thyroid symptoms, despite taking thyroid medications like Synthroid and Levothyroxine.

Some people feel significantly better on natural desiccated thyroid (NDT) medications like Armour thyroid, WP Thyroid and Nature-Throid (think the gorgeous former Baywatch star [Gena Lee Nolin](#), who is a spokesperson for Nature-Throid). NDT medications contain roughly four parts of T4 to one part of T3.

However, according to Goodman and Gilman's: The Pharmacological Basis of Therapeutics (one of the “bibles” of modern pharmacotherapy), the human thyroid secretes 11 parts of T4 to 1 part of T3.

Pharmacist Bob ListECKi decided to apply the principles of bio-identical hormone therapy that are used for estrogen/progesterone to thyroid medication.

What is the ListECKi-Snyder Protocol?

According to pharmacist Bob ListECKi, “The ListECKi-Snyder Protocol is an ability for a compounding pharmacist to recreate the ratio of T4 to T3 that is present in the human thyroid gland.”

As a thyroid patient himself, Bob felt like he was not feeling as great as he could on his thyroid regimen. “We increased my dose of thyroid medication, which took care of some of the symptoms, but then I started to have tendon inflammation, which I attributed to too much T4. So we reduced my Synthroid dose from 125mcg to 112mcg, but I still didn't feel optimized. I then tried Armour, and was really bouncing around not feeling my best.”

After coming across an article on thyroid medications in the *US Pharmacist* magazine, Bob learned that the human thyroid gland actually contains a ratio of 11 parts T4 to 1 part of T3. This is very different to the ratio in Armour, Nature-Throid and other desiccated thyroid products.

Bob was fascinated by this information, and had his pharmacy intern Dr. Scott Snyder, PharmD, research the bioavailability of the oral forms of T4 and T3. Based on the amount of hormone that is actually absorbed from the oral doses, they calculated an adjusted ratio, of **13.06 parts of T4 to 1 part of T3** that would accurately deliver a ratio of 11 to 1 in the blood stream.

The Listecki-Snyder protocol gives us less active T3, and rather than taking the entire dose in the morning, the Listecki-Snyder protocol splits the daily dose of T3 into two sustained release capsules, which are given every 12 hours, while the entire dose of T4 is taken in the morning.

Who may benefit from this dosing?

According to Pharmacist Bob, people who are not optimized on T4 but who are not able to tolerate Armour, due to the high T3 content, may benefit from this kind of new dosing.

Armour has been a long time patient favorite, but due to its once per day dosing and 4.2-1 ratio that converts to 4-1 in the body, some may get too much T3 from it, and as T3 has a half-life between 6-16 hours in the body, this may result in highs and lows, putting the body on a roller coaster. Some may feel this as palpitations, mood swings or hot flashes.

Anecdotally, some thyroid patients have found that T3 containing medications worsen their adrenals and, theoretically, a slow and steady release of a lower, physiological dose of T3 should counter that issue.

So a person who was perhaps not feeling optimal on Armour or Synthroid would take one dose of T4 in the morning, along with one dose of the suspended release T3. Then the person would take a second dose of T3 12 hours later.

Pharmacist Bob cautions that if you are on T4, you need to drop the dose by 30%, then calculate the ratio. If you don't reduce the T4, and just add T3, people may not be able to sleep at night and have too much energy.

Patient Response

Pharmacist Bob pays careful attention to all of the patients on this protocol at his pharmacy. “Overall, patients come and say that they feel a lot better and that they have more energy. Their levels of TSH, T4, T3 come out balanced as well”. According to Mr. ListECKi however, it may take about 90 days to stabilize on this dose vs the usual 4-6 weeks it takes to stabilize on other regimens.

My Recommendation

If you think that this type of dosing would help you, I highly recommend that you speak with your local compounding pharmacist. As a caution, not all compounding pharmacists are equipped to handle this type of compound.

This is because compounded thyroid medications are dosed in 1/1000 of a milligram. There is a lot of room for error, and I always recommend working with pharmacies that use Professional Compounding Centers of America (PCCA) thyroid starters. PCCA pre-dilutes the thyroid hormones 1000 times, allowing for more precise dosing.

Compounding pharmacists who subscribe to the International Journal of Pharmaceutical Compounding are your best bet, this way you know that they are keeping up with the latest innovation in the world of pharmaceutical compounding.

Additionally, in my experience, some people with Hashimoto's and severe gut issues may not be able to properly absorb methocel, a suspending agent used to make a suspended release version of thyroid medications, so if you and your doctor are considering this option, you want to be sure to do follow up thyroid testing within 2 weeks. Make sure your TSH, Free T3 and Free T4 are staying within an appropriate range - if your TSH is increasing and the Free T3 and Free T4 begin plunging, you may not be absorbing this form properly.

We've done some of the legwork for you and have a list of compounding pharmacies [here](#). Some have consultant pharmacists on staff who can further guide you in your healing journey as well (like Pharmacist Bob helped me in mine!), and in addition to advising you about compounded thyroid medications, the pharmacists can advise you about other innovative options for people with autoimmune disease including [low dose naltrexone](#), which is a unique compounded medication that can help put Hashimoto's into remission.

Questions to ask your compounding pharmacist:

- What types of fillers are used?
- What is the source of the materials? (We recommend [PCCA](#) sourced materials)
- Is the compound slow release or immediate release?

Resources

[Compounding Pharmacy Listing](#)

[Listecki Snyder Protocol Dosing Table for Physicians](#)

[Professional Compounding Centers of America](#)

[International Journal of Pharmaceutical Compounding](#)

[Listecki-Snyder Protocol PubMed Citation](#)

[Glen Ellyn Pharmacy](#)

About Bob Listecki, RPh of Glen Ellyn Pharmacy

Glen Ellyn Pharmacy has been a family owned business for 52 years. Bob Listecki, RPh, "Ask Dr Bob" compounds medicine for people with special needs. Bob Listecki, teaches pharmacy students at local colleges and is an authority on all types of medicines and specializes in Symbiotic Therapy.

Glen Ellyn Pharmacy is located at 486 Roosevelt Rd, Glen Ellyn, IL ((630) 469-5200) and Pharmacist Bob is available for paid consults.

Publication

The Listecki-Snyder Protocol has been published in the International Journal of Pharmaceutical Compounding (IJPC). To meet publication deadline, dedicated pharmacy Scott Snyder continued to work on the article while he was on his honeymoon in Thailand! The abstract can be viewed [here](#).

Appendix B

Circadian T3 Method

As a pharmacist, I'm passionate about appropriate medication use and giving you the information you need to have the best possible outcomes - whether it is about diet, supplements, lifestyle changes or medications, I want to share what has worked for others, with the hope that it will help you.

I wanted to give you all some great information on alternative medication options for those of you who are having thyroid symptoms with the standard thyroid treatments.

I was very impressed with Paul Robinson's book ["Recovering with T3"](#). Paul was gracious enough to agree to an interview:

Izabella Wentz: Paul, tell us about the beginning of your journey with Hashimoto's...

Paul Robinson: Well, I had no idea that I had a thyroid problem at all. I was about 30 years of age and my wife had just given birth to our second child. It was quite a fast birth and she and my newborn son were both fine. For some strange reason I picked up the heart rate monitor that had been attached to my wife and put it on for a few minutes. My heart rate was forty-two beats per minute!!!! We thought the machine had broke so my wife tried it and hers was normal. We both realized something was wrong.

I was a senior manager in a research and development role and I'd been struggling to do the same quality of work that I was used to doing for some time. I'd put a lot of weight on and was having a hard time remembering things, including peoples' names. I had assumed it was stress related. But the low heart rate suggested a physical disease. I went to see my family doctor and she ran a large set of tests. I was lucky because I think she must have suspected a thyroid issue. She actually ran TSH, FT3, FT4 and the autoantibody tests for TPO and Tg autoantibodies!!! It is unusual even today for a doctor to run the complete set of these laboratory tests without a lot of begging and pressure. I honestly think the entire set of laboratory tests ought to be run in the first instance if anyone is suspected of having a thyroid issue.

My results came back with a TSH of over 60, low FT3 and FT4 and very high TPO and Tg autoantibodies. My family doctor told me that I had Hashimoto's thyroiditis and that I'd need to take Levothyroxine (T4/Synthroid) for the rest of my life. I think she actually said something like, "You'll just need to take this medication for life and you'll be fine!" That turned out not to be the case, of course. I was far from fine!

I had about 3 weeks during which I did actually feel a lot better (I understand this now - this is a phenomenon that we frequently see when someone starts T4 or even when someone increases their dosage, but this improvement frequently doesn't last). After the initial improvement, I went downhill again and my symptoms returned. After many months of increases in Levothyroxine medication, and after my thyroid blood tests had become what my family doctor and the endocrinologist I was sent to considered normal, I was pronounced 'cured'. My TSH was in range, FT3 and FT4 were in range but I had virtually all of the symptoms that I had to begin with. My energy level was dreadful, I was not coping with stress, my weight was still an issue, I had multiple digestive system symptoms including bloating and food sensitivities (worse now on the T4 meds), dry skin, dry hair etc. I still had hypothyroid symptoms but my laboratory tests looked 'normal' according to my doctors.

This is so very common yet my doctors were convinced any symptoms I had now were due to some other condition! How crazy is this? Yet, this is still what happens today, twenty-five years on from when I was diagnosed, the same arrogant and very naive arguments are still being given to thyroid patients. There is a simple piece of logic known as 'Occam's razor' which I think is so relevant to thyroid treatment. If a thyroid patient has a set of classic hypothyroid symptoms prior to treatment with thyroid hormone and then still has most of these symptoms after the 'treatment' then the most likely conclusion is that the 'treatment' did not work or was not the right treatment. The least likely conclusion is that the 'treatment' was a total success and that some other disease is causing the symptoms. This is especially true if the 'other disease' cannot be named, treated and cured. However, this very simple piece of logic is rarely applied and thousands of thyroid patients are just simply left sick for years on thyroid treatments (often T4 based) that do not work.

I saw several different family doctors and many endocrinologists over the next six or seven years and my thyroid hormone dosage was adjusted again and again, but to no avail. I was very ill and began to have time off work. My career was being seriously damaged and the impact on my family life was also significant. There is not enough time here to discuss the broader impact on an individual's life but the toll can be high. I did in fact permanently lose the career that I loved and it did cause damage to relationships between my family and myself. Ultimately, the events that unfolded from poorly treated hypothyroidism had a part to play in my wife and I divorcing. The human cost of this disease can be very, very high. I always try to consider this when I talk with any thyroid patient.

IW: When did you decide to take charge of your own health?

PR: It became obvious to me after two to three years after my initial diagnosis that for

some reason the thyroid replacement hormone (Levothyroxine/T4) that I was been given was not working for some reason. My background is in science and I'd spent my career in R&D. Consequently, my approach was not just to continue to change doctor and endocrinologist in the hope I would find someone more able but I also began to do my own research. The way I went about this was mainly to buy endocrinology textbooks. I found out which textbooks doctors who begin to specialize in endocrinology were asked to buy during their treatment and I bought several of these. I also began to use the Internet (which was in its infancy but still had some useful information). I actually found that the endocrinology textbooks to be more valuable than any other source of information.

It seemed obvious to me from the reading that I did, that simply being given Levothyroxine was no guarantee that the biologically active thyroid hormone T3 was going to be converted in a high enough volume, from T4 based meds. I wanted to put this to the test and try alternative thyroid hormone treatments like natural desiccated thyroid and T3 (Liothyronine sodium).

The more I read on this subject, the more I was convinced that my symptoms were actually a combination of classic hypothyroid symptoms and symptoms typical of adrenal function that is too low (and especially low cortisol). However, having had all the usual laboratory tests for thyroid hormones and a Synacthen test for Addison's disease, and having being told everything was normal. there appeared that no medical professional was going to be able to help me. I had been told that I had Chronic Fatigue Syndrome or M.E. and it was clear that the doctors I had seen were happier to give me a label than to actually help me get well.

By this stage, I was seven years down the road from diagnosis and I was close to losing my job and my career. I had to do something or give up.

IW: How Did You Get Your Life Back?

PR: I got my life back by beginning to think and act for myself. I took responsibility for my own health. I gave up turning up in a doctor's office and handing over ownership for my health as I entered the room. If I saw a doctor for laboratory tests or to discuss something it was still me who owned my own health and had 100% responsibility for it. My doctor might be able to help me, but I was the manager of my own destiny.

Time is a critical resource in thyroid disease. Time can disappear slowly in small pieces, one piece at a time. Then one day, five years can have gone by or maybe even a decade or more. Going for medical appointments, having laboratory tests, waiting to see if the latest T4 dosage change can be like the 'death by a thousand cuts'. Life is far too short and too precious to stay ill when there are perfectly good treatment methods available.

I began to search around for doctor's who might enable me to try the alternative thyroid hormones that I thought might be helpful to me. I found some doctors who allowed me to do what I needed to do. This would not have happened if I had not taken ownership for my health though.

Eventually, T4 was stopped and I was given trials of natural desiccated thyroid medication and, when this did not work, I was prescribed synthetic T4 together with synthetic T3. None of these alternative treatments corrected my symptoms even though my thyroid blood test levels all looked perfect. I remained with symptoms that included: exhaustion, weakness, dry skin, dry hair and digestive system problems. My mind felt like it was in a mist, I could not think completely clearly and had low blood pressure. At the start of my illness I had put on a lot of weight, but as partial adrenal insufficiency became part of my issues I lost weight, became weaker and I began passing out.

I was eventually prescribed T3 only and then I began to get well, but it took me three years to begin to know how to use T3 correctly. In total, it took me about 10 years to recover from the start of my hypothyroidism. I lost a decade of my life when my children were young. It then took me another 10 years to be able to reflect on and communicate my experience with T3 and how T3 could be used safely and effectively. This work has led to the writing of my two books.

Sometimes T3 only treatment is the only one that will work, even if thyroid hormone blood test results look excellent when the patient is taking synthetic T4 or T4/T3 combination therapy. This conclusion is very clear to me from my own experience and from communicating over the past six or seven years with hundreds of thyroid patients all over the world. Some issues cannot be seen through blood tests because they occur deeply within the cells of the body. In these cases, the biologically active thyroid hormone T3 needs to be present in high levels in the bloodstream with little or no competition from T4 or reverse T3, in order for enough T3 to become active in the cells.

The right thyroid hormone treatment alone is also not enough for many patients. Sometimes dietary changes and supplementation with appropriate nutrients is also required. Many systems in the body can begin to be less healthy after years of untreated hypothyroidism. Some of these may have led to the hypothyroidism in the first place. Treating the whole person is often required. Gut health, adequate levels of nutrients like iron, B12, magnesium, mitochondrial health, dealing with toxicity and many other issues may need to be looked at for some people to gain a full recovery.

IW: How do you feel now?

PR: I have used T3 only now for around seventeen years, with some limited support

from my family doctor and endocrinologist. Hashimoto's thyroiditis has destroyed my own thyroid gland. Consequently, the 60 micrograms of T3 I take per day in four separate doses produces rather strange thyroid blood test results, even though I am perfectly well. My TSH is near 0 mU/L. My FT3 is between 8 and 9 nmol/L (top of my labs' range is around 6.5) and my FT4 is near 0 pmol/L. Most family doctors and endocrinologists would be extremely unhappy with these results and say I was hyperthyroid or even suffering from thyrotoxicosis but I am not. At the cellular level my body is getting just the right amount of FT3 I need, even though in my bloodstream it is high. This raises a fundamental point that is at the heart of many issues in thyroid treatment today. Laboratory testing of thyroid hormones and simplistic diagnostic work based on this is leaving many thyroid patients with chronic symptoms associated with hypothyroidism.

The ['Recovering with T3'](#) book presents a safe, effective and systematic process for using the T3 thyroid hormone when other forms of thyroid hormone replacement have failed. This method covers basic diagnostic lab work that needs to be performed, supplementation with important vitamins and minerals and a detailed process that may be followed when using T3. Part of this process includes a radically new protocol for using T3, in order to regulate the function of the adrenal glands and help them to function properly without the use of any adrenal steroids (like hydrocortisone) or adrenal glandulars. This protocol is called the circadian T3 method (abbreviated as CT3M).

The CT3M corrected my own adrenal function and enabled the T3 I took during the daytime to work properly. I got my health back, and in the process I discovered how to use T3 optimally. The CT3M is a breakthrough and it is now being used by thyroid patients worldwide and in many cases it is allowing them to recover their health after years or even decades of illness. Those patients using natural desiccated thyroid can also use the CT3M, as this also contains T3 thyroid hormone. *I have now produced a second book called ['The CT3M handbook'](#), which discusses CT3M in far more detail than I presented in my first book ['Recovering with T3'](#).*

Many hormones follow a circadian rhythm with a pattern of secretion that is repeated every twenty-four hours and is typically linked to our cycles of sleeping and waking, or daylight and night. Cortisol is secreted by the adrenal glands, with a steady rise in production during the last four hours of sleep. For someone who gets up out of bed at 8:00 am, this means the highest level of cortisol production occurs between the hours of 4:00 am and 8:00 am. It is the rising level of cortisol that helps us wake up in the morning, with the highest level of cortisol in the bloodstream at around 8:00 am (for a typical person who gets up at 8:00 am). Cortisol levels then fall gradually during the day and are at their lowest between midnight and 4:00 am in the morning. The exact times may vary depending on when someone gets up in the morning (e.g. shift workers may experience a different circadian rhythm).

The Circadian T3 Method (CT3M) utilizes the circadian natural action of the adrenal glands and requires thyroid medication that contains pure T3 (so natural desiccated thyroid may also be used). Once low adrenal function has been confirmed (ideally with a twenty-four hour adrenal saliva test), then the CT3M may be used. The CT3M will not work if the thyroid patient has Addison's disease or hypopituitarism (these conditions usually require lifetime treatment with adrenal steroids).

The basic idea behind the CT3M is to address low levels of the active thyroid hormone (T3) in the adrenal glands when they are producing their highest volume of cortisol. Once this process begins to work and the adrenal glands begin to function well, then the quality of the sleep that follows this circadian dose is often far better than the thyroid patient has been used to experiencing.

In recent years there has been research that confirms that T3 thyroid hormone peaks in the body when the adrenal glands begin to work hard in the early hours of the morning. These research findings support the ideas behind the CT3M. The research article is titled "Free triiodothyronine has a distinct circadian rhythm that is delayed but parallels thyrotropin levels." and is published in [J Clin Endocrinol Metab. 93\(6\):2300-6. June 2008](#). The research basically says that after TSH has peaked each day around midnight, that FT3 also peaks some hours later.

So, in a healthy person with a normal working thyroid gland, their free T3 levels will peak in the early hours of the morning. For those thyroid patients on thyroid medication this is normally not the case and thyroid hormones will be at a low point in the early hours of the morning. The CT3M is aimed at replicating nature and restoring a good level of T3 when the adrenal glands begin to produce high levels of cortisol.

A large number of thyroid patients have successfully used the CT3M over the past few years. Many of these patients had previously found that the only way they could cope was through the use of adrenal steroids like hydrocortisone or adrenal glandulars that contain steroids at lower quantities. When adrenal steroids are employed, this causes the pituitary to demand less work from the adrenal glands. The consequence of this is often that the thyroid patient's adrenal glands become sluggish and less able to work on their own. The CT3M often works well enough to allow these patients to slowly reduce and then stop the use of all adrenal steroids.

I've produced a post on my blog, which includes a [video](#) that explains more about CT3M.

IW: What is your advice for other Hashimoto's patients?

PR: My main pieces of advice are:

1. Learn as much as you can - knowledge is power. Read books. Look at websites. Talk to other thyroid patients.
2. Take ownership for your own health. If you do not respond to standard thyroid treatment then recognize this as soon as possible and take back responsibility for your health - don't just hand it over with a list of symptoms to your doctor and hope that they can fix you. The reality today is that most doctors who treat thyroid disease continue to rely heavily of thyroid laboratory tests to tell them what level of T4 based medication their patients should be using. For many thyroid patients this will leave them being symptomatic. Thyroid blood tests show the levels of thyroid hormones that are circulating in the bloodstream. Thyroid blood tests do not show how effective the main biologically active thyroid hormone T3 is being within the cells (in the cell nuclei and the mitochondria). Only symptoms (like energy level) and signs (like body temperature) can show how the body is actually responding to thyroid hormone.
3. Be prepared to have trials of other thyroid hormones like natural desiccated thyroid or T3 (liothyronine).

IW: What Kind of Resources Do You Provide for Thyroid Patients?

PR: Here are some resources available for thyroid patients considering using T3:

1. The 'Recovering with T3' book, which is available on [Amazon](#), The Book Depository, Barnes and Noble and other Internet booksellers. This book provides a comprehensive background on T3 and its safe and effective use in the treatment of hypothyroidism that has not responded to T4 based medications (even though blood test results might be normal).
2. '[The CT3M Handbook](#)', which is also available from Internet booksellers. This book provides more information on the Circadian T3 Method of treating partial adrenal insufficiency (adrenal fatigue).
3. [My website](#), which contains a range of information on T3, my books, patient success stories and my blog.

The full list of blog posts can be found [here](#).

The full list of patient success stories can be found [here](#):

4. My [Facebook patient forum/discussion group](#) for thyroid patients who want to talk about T3 use (and the use of CT3M if this is relevant to them):
5. My book [Facebook page](#), which is used to communicate any new information posted on my website and any new information regarding my books or my work.

I hope the stories and information shared provides you with the ability to make informed decisions and encourages you! Whether you take the traditional route or seek alternative methods of treatment, know that you are your body's advocate. As you can see, there are a variety of options available so it's important for you to find out which one is best for you and your own journey. Ask questions, research and make choices that make you comfortable. It's all about progress not perfection!



Dear Reader,

I hope that you have found this guide helpful.

I'm passionate about teaching patients and clinicians how to overcome and reverse Hashimoto's! I've dedicated the last 5+ years to research on the subject. The more I learn, the more I share. You can sign up to get the Depletions and Digestion chapter of my book, a free thyroid diet guide and recipes at www.thyroidpharmacist.com/gift

If you found this short guide helpful, you may also like my [Hashimoto's book](#), [website](#) and [Facebook page](#). Wishing you all the best on your journey!

Warmly,

Izabella Wentz, PharmD, FASCP

The medical information in this eBook is provided as an educational resource only, and is not intended to be used or relied upon for any diagnostic or treatment purposes. This information should not be used as a substitute for professional diagnosis and treatment.

Please consult your health-care provider before making any health-care decisions or for guidance about a specific medical condition.

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[Desiccated Thyroid Extract and Levothyroxine for Hypothyroidism Treatment \(DTE\)](#)

[The Effect of Hydroxychloroquine Treatment in Hashimoto's Thyroiditis](#)

[New manufacturing issues lead AbbVie to 2nd Synthroid recall](#)

[2012 Clinical Practice Guidelines for Hypothyroidism in Adults](#)